Report of the Comptroller and Auditor General of India

for the year ended March 2004

Union Government (Commercial)
Public Sector Undertakings

National Highways Development Project of National Highways Authority of India

No. 7 of 2005

CONTENTS

PREFACE

A reference is invited to the prefatory remarks in the Report of the Comptroller and Auditor General of India-Union Government No.1 (Commercial) 2005 where a mention was made that reviews of the performance of Companies/Corporations by the Comptroller and Auditor General of India are presented in separate Reports.

This Report examines the Construction of Highways by the National Highways Authority of India (NHAI) under National Highways Development Project (NHDP), Phase-I including its planning and funding mechanism. This Project envisaged up-gradation to four/six lane of the existing two lane wide National Highways on Golden Quadrilateral linking the four metro cities of Delhi-Mumbai-Chennai-Kolkata, North-South Corridor linking Srinagar and Kanyakumari and East-West Corridor connecting Silchar and Porbandar.

The Central Road Research Institute (CRRI) was engaged as our technical consultants for the review. The technical inspection of four Project Implementation Units (PIU) including seven stretches was done by CRRI.

This Report as set out in the succeeding chapters is based on test check of records of NHAI Head Office and 32 stretches spread over 12 States covering 21 PIUs, inputs included in CRRI Reports and the discussions held with the Management of NHAI and the Ministry.

The cases mentioned in the Report are among those which came to notice in the course of audit conducted during the year 2003-04 and during earlier years wherever relevant.

OVERVIEW

The National Highways Authority of India was entrusted (December 1998) with the responsibility of implementing the National Highways Development Project comprising the Golden Quadrilateral (GQ) linking four metro cities of Delhi-Mumbai-Chennai-Kolkata and the North-South Corridor linking Srinagar-Kanyakumari and the East-West Corridor connecting Silchar-Porbandar covering a total length of 13,146 km at an estimated cost of Rs.58,000 crore.

The execution of NHDP was planned to be completed in two phases. Phase-I comprised 6,359 km at an estimated cost of Rs.30,300 crore and was scheduled to be completed by June 2004. Largely, it comprised the completion of Golden Quadrilateral. NHAI could complete works to the extent of 1,846 km (29 per cent) upto June 2004. The corridor-wise achievement in completion of work in respect of Delhi-Mumbai, Mumbai-Chennai, Chennai-Kolkata and Kolkata-Delhi upto June 2004 including partially completed stretches was 82 per cent, 46 per cent, 45 per cent and 25 per cent respectively. The balance works are expected to be completed by December 2005. The corridor concept as envisaged was yet to emerge.

NHAI did not standardise its procedures and contract documents. The inconsistencies and infirmities in the contract conditions led to contractual complications, overpayments and delays. NHAI also did not ensure enforcement of contract provisions for quality assurance and project management. This resulted in execution of sub-standard works in seven stretches test checked for quality out of 32 stretches examined in audit.

NHAI took up contracts for twenty works (value Rs.779 crore) without detailed project reports (DPRs). Further, there were variations ranging from 12.26 to 86.82 per cent between the awarded cost and executed cost in respect of nine stretches indicating deficiencies in DPRs.

NHAI did not standardise the length of stretches for award of contracts to facilitate cost comparison for award and execution of work nor did it devise any more robust and effective cost control mechanism as an alternative. This resulted in variation in cost per km of contiguous stretches from Rs.1.86 crore to Rs.4.20 crore per km.

NHAI did not standardise its procedure for tender evaluation and award of work. NHAI did not manage its finance professionally. NHAI mobilised excess funds bearing avoidable charge towards interest.

NHAI did not follow the accounting practices required to maintain asset accounts on commercial principles. The completed stretches were continued to be exhibited as Capital work–in-progress instead of showing them as Fixed Assets. Fixed assets created out of grants were also being exhibited as capital work-in-

progress. The administrative Ministry had not given any directions to NHAI about the ownership of the assets.

The total financial implication of the above Review is Rs.1,547.99 crore.

NATIONAL HIGHWAYS DEVELOPMENT PROJECT PHASE-I

HIGHLIGHTS

- Overall performance of NHAI in terms of output in National Highway Development Project Phase-I was 29 per cent. NHAI completed only 1,846 km in terms of completed stretches out of the target of 6,359 km of National Highways by the scheduled date of June 2004. There was no corporate plan to implement such a large project. Deficient planning and inefficient contract management by the design and project consultants contributed to underperformance in achievement of the target. The underperformance was 59 per cent if partially completed stretches were also reckoned.

(Paras 2.1 and 4)

- Phase-I of the project consisted of the National Highways connecting the four metros, forming the Golden Quadrilateral consisting of 5,014 km; port connectivity of 674 km and North-South-East-West corridors of 671 km. NHAI missed the completion goals of all three by 73, 67 and 58 *per cent* respectively. NHDP Phase-I had been re-scheduled for completion by December 2005, overshooting the original schedule by 18 months.

(Paras 1.3 and 2.1)

- The adverse impact of the significant underperformance resulted in unrealised expected benefit of free flow of traffic on these routes. Additionally, NHAI also lost an opportunity to generate toll revenue of at least Rs.560 crore due to the delay in completion of the highways. Besides, the road users also lost potential economy in vehicle operating cost of about Rs.4,300 crore over the period of delay.

(Paras 2.1 and 2.2)

- While the overall status of the output is stated in this report with reference to the entire NHDP Phase-I consisting of 175 stretches, the detailed finding and conclusions are with reference to scrutiny of a sample of 32 stretches, which were selected on the basis of 50 *per cent* or more progress. The audit tests on the sample disclosed that the completed works had suffered delays of upto 28 months from their scheduled dates, with cost overrun of over Rs.690 crore including additional items of work in these stretches alone. In the background of the delay in completion in other stretches, the cost overrun on the entire project is likely to be substantially more, which may compromise the economy of the entire project.

(Para 2.1)

- Imprecise terms of contract with the design consultants, who were responsible for preparation of detailed project reports (DPRs) and project supervision consultants (PSCs), who were responsible for supervision of the works and their underperformance constituted the foremost risk to the project. NHAI did not address the risk associated with the terms of contracts and performance of the two

categories of consultants with adequate attention, which ultimately became the prime reason for time and cost overrun. NHAI failed to determine comprehensively the terms of reference for preparation of the DPRs by the design consultants and of project supervision by PSCs. The quality of DPRs and the project supervision were left to the discretion of the consultants rather than binding them to comprehensive terms of reference, which severely compromised the value for money spent on hiring them and on the project. The terms of both the consultants did not provide for performance warranty and penalty for underperformance.

(Paras 3.1 and 3.2)

- DPRs were found deficient in terms of precise determination of quantities and nature of the items of works, land to be acquired, sub-soil investigation, bridge design, correct technical specifications, number of trees to be felled, services/utilities required to be shifted, and designs of various key items of work. The inaccuracy in the quantities of works upset the competitive rates of the bidders, which formed the basis of award of contracts in one case.

(Para 3.2)

- NHAI did not ensure compliance to the quality assurance procedures by the PSCs. They failed to obtain quality assurance plans from the contractors in some cases. Besides, PSCs did not carry out the quality control checks comprehensively to ensure that the quality of the roads was consistent with the specifications. The documentation on quality assurance and quality control by PSCs was incomplete. Independent quality check in seven stretches carried out by the Central Road Research Institute, engaged by Audit, disclosed works which did not uniformly conform to the specifications. It also indicated inefficient contract management by PSCs.

(Paras 2.5 and 7.2.4)

- The performance of PSCs was found wanting in overall supervision of the project, verification of works and bills, variations in the works, determination of rates of payment for varied quantities, approval of the sub-contractors, recommendations on extension of time and compliance to the terms of contract by the civil contractors. Underperformance by PSCs entailed a high risk of overpayments and quality compromise.

(Paras 7.2 and 8)

- NHAI delayed the award of contracts after receipt of bids by upto 17 months beyond the bid validity period entailing extra expenditure due to price escalation. It did not follow comprehensive and uniform criteria / standard for evaluation of bids.

(Para 4.1)

- NHAI did not prepare the contract documents with due care, which resulted in inconsistent and faulty contract clauses. Defective contract clauses with regard to price escalation, re-fixation of rates for variations, recovery of advances etc.

provided extra financial assistance to the contractors affecting the economy of the project. This entailed a risk of financial loss and contractual/legal complications.

(Paras 3.1, 5.1, 5.2 and 5.3)

- NHAI foreclosed the opportunity to compare the estimates, quoted rates and actual expenditure per unit length by not standardising the highway stretches or putting in place any more robust and effective cost control mechanism as an alternative, which deprived it of a framework for evaluation of the rates and cost. The cost per km in the contracts varied from Rs.1.86 crore to Rs.4.20 crore in contiguous stretches awarded during the same time.

(Para 4.2)

- Similarly NHAI did not standardise or install any alternative cost control mechanism and determine the bills of quantities (BOQ) of various items used in the road construction. The extra cost worked out to Rs.260.98 crore with reference to the lowest quantities of bituminous work in the 23 stretches, for which analysis was made. The quantities of bituminous work per unit length shown as having been used varied upto 12.80 times.

(Para 5.4)

- Deficient internal control and accountability system within NHAI was responsible for loss of Rs.24.44 crore in the sample stretches only on account of non-recovery of amounts from the contractors. NHAI failed to verify the authenticity and validity of the bank guarantees provided by the contractors.

(Para 7.1.1)

- Validity of cash forecast by NHAI had also been rendered questionable. The projected cash surplus of Rs.13,239 crore in Phase-I by the end of 2011-12 is not likely to be achieved and there is a probability of NHAI suffering cash deficit at the end of 2011-12. On the other hand, due to slow progress of the works, NHAI was left with surplus funds mobilised through bonds and consequential avoidable charge of Rs.77.25 crore towards interest during 2000-01 and 2001-02.

(Paras 2.3 and 9.2)

- NHAI was slow to introduce tolling on the completed portions of the road and lost about Rs.42 crore due to delayed decisions/notifications.

(Para 2.4)

- Accounting practices adopted by NHAI were not in consonance with the Generally Accepted Accounting Practices. NHAI exhibited 39 completed stretches valuing Rs.3,079.65 crore as Capital-Work-in-Progress (CWIP). Assets created out of Government Grants and Loans were also exhibited as CWIP against NHAI's own accounting policy. The ownership of the assets obtained during the course of execution of works has not been decided. Interest earned on unutilised funds amounting to Rs.1,715.43 crore was also credited to the capital.

(Para 11)

Summary / Gist of Recommendations

NHAI may:

- strengthen its planning regime and follow up mechanism with various authorities/agencies so as to avoid bottlenecks like land acquisition, tree cutting and shifting of utilities that caused avoidable delays and consequent cost overruns. These activities may be synchronised and greater emphasis be laid on monitoring critical activities in the achievement of targets in a time-and-cost-bound manner.
- evolve a system where Detailed Project Reports are reviewed before the commencement of tendering process so as to avoid large variations, adoption of non-uniform specifications for similar site conditions, sub-standard construction quality and inefficient project management on account of insufficient and inaccurate information / data contained in the DPRs.
- ensure standardisation and uniformity in contract provisions and approval process which would enhance efficiency and help avoid lapses; this would result in less contractual complications during project implementation.
- include and invoke stringent provisions in the agreements against erring consultants to convey seriousness in action in view of the major omissions by the consultants that led to substantial time and cost overruns. NHAI may also fix bid capacity for Project Supervision Consultants (PSCs) and ensure that the same key personnel are not proposed for multiple projects.
- devise vendor development policies and framework so that better competition in terms of cost as well as technology transfer could be generated; NHAI needs to improve the monitoring of quality of work done by the civil contractors.
- ensure better financial management and closer monitoring of cash management to bring down the cost of capital as well as cost reduction; toll notification and collection system needs to be systematised and made more efficient.
- avoid delays in issuance of gazette notification for tolling, handing over of site, finalisation of site for the toll plaza through better planning and timely action to prevent loss of toll revenue.
- maintain its accounts on commercial principles in consonance with the Generally Accepted Accounting Practices.

CHAPTER 1

Introduction

1.1 Background of National Highways

The National Highways (NHs) comprised only two per cent of the total road network in India but carried over 40 per cent of the total traffic. Of the total length of NHs of 58,112 km about 25,000 km was under severe strain due to high volume of traffic coupled with insufficient maintenance resulting in poor riding quality. The Government, therefore, took up prioritisation of projects for upgradation of NHs and launched the National Highways Development Project (NHDP) in October 1998.

1.2 National Highways Development Project

The total length of NHs envisaged to be upgraded under NHDP was 11,404 km* in addition to formation of Expressways for 1500 km, at an estimated cost of Rs.54,000 crore. The Government also decided to implement 1,000 km of other NH works including road connectivity to the major ports@ in the country. These works required an additional investment of Rs.4,000 crore. Following this, the Cabinet in its meeting held in April 2000 accorded 'in principle approval' of NHDP at an estimated cost of Rs.58,000 crore.

Prior to the launch of NHDP, State Public Works Departments (PWDs) were implementing NH projects. Since the performance of the State PWDs was not found satisfactory, the Government decided (December 1998) that National Highways Authority of India (Authority) would take up NHDP work for expeditious implementation of the project.

NHAI outsourced the preparation of Detailed Project Reports (DPRs) to DPR consultants selected through competitive bidding.

NHAI followed FIDIC (International Federation of Consulting Engineers) system of project supervision where the project management of the awarded stretch including day-to-day supervision, quality assurance, issuance of working drawings, approval of mix formulae for road layers, approval of variations and their rates, measurements of work done and certification of payments to civil contractors, recommendation of Extension of Time (EOT), levy of liquidated damages (LD) etc is entrusted to an independent technically qualified contractor called Project Supervision Consultant (PSC) selected through competitive bidding.

The field formations of NHAI for execution of NHDP comprise Project Implementation Units (PIUs) headed by Project Directors (PD) who are assisted by Managers and other

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* ***Excludes 1,848 km already four laned/under implementation but includes 106 km of overlapping stretches***

@ ***At Chennai and Ennore, Cochin, Haldia, Kandla, New Mangalore, Mormugao, Mumbai (JNPT), Paradip, Tuticorin and Vishakhapatnam***

support staff. A PIU may oversee more than one stretch[&]/contract. There were 50 PIUs (March 2004) located all over the country. Separate project reports are required to be prepared for each stretch and the works are executed by separate civil contractors engaged through competitive bidding.

1.3 Scope of National Highways Development Project

The primary mandate of NHAI was time and cost bound implementation of NHDP through host of funding options including loans from external multilateral agencies like the World Bank, Asian Development Bank and Japan Bank of International Cooperation (JBIC). Works mainly comprised strengthening and four-laning (11,646 km) and six-laning (1,500 km) of high-density corridors measuring 13,146* km. The components are:

Golden Quadrilateral (GQ) - 5,846 km connecting the four metropolitan cities of Delhi-Kolkata-Chennai-Mumbai

North-South and East-West Corridor (NSEW) - 7,300 km connecting Srinagar to Kanyakumari and Silchar to Porbandar

NHDP was planned to be implemented in two phases. Phase-I comprised 6,359 km (GQ 5,014 km, NSEW 671 km and others 674 km (Port connectivity works 400 km and bypasses etc 274 km) at a cost of Rs.30,300 crore. NHDP Phase-I was scheduled to be completed by June 2004.

The mandate also included:

i. Involving the private sector in financing the construction, operation and maintenance of NHs and wayside amenities.
ii. Development and maintenance of the NHs network.
iii. Implementation of road safety measures and environmental management.
iv. Introducing Information Technology in construction and maintenance of NHs.

NHAI was to implement the projects in five stages viz., selection of stretches, pre-tender activities, preparation of Detailed Project Reports (DPR), award of supervision contracts and award of civil construction contracts apart from monitoring and contract management.

1.4 Scope of Audit

Records relating to the conception, planning and implementation of the selected sample stretches were examined at the Head Office of NHAI and field formations (PIUs). The selection of stretches for test check was made on the basis of their geographical spread and physical progress as on 30 June 2002. The test check covered 32 stretches (18 per cent of total of 175) measuring 1,266 km as detailed in **Annexure -I** spread over 12 States and covered 21 PIUs with total contract value of Rs.4,508 crore (15 per cent of Rs.30,300 crore, the estimated cost of NHDP, Phase-I). The review sample included:

[&] A stretch is an identified road length to be strengthened/widened through specific contract

** Indicates11,404 km to be upgraded which excludes 1,848 km already four laned/under implementation but includes 106 km of overlapping stretches*

- 21 completed stretches executed by NHAI, (GQ=13 stretches, NSEW = eight stretches)
- 11 ongoing works (where the physical progress was 50 per cent or more) (GQ = nine stretches, NSEW = two stretches)

1.5 Audit objective

Performance audit of the National Highways Development Project, Phase-I consisting of total road length of 5,014 km Golden Quadrilateral connecting the four metro cities viz, Delhi, Kolkata, Chennai and Mumbai, port connectivity of 674 km for providing better connectivity to ten major ports and North-South-East-West corridors of 671 km, was carried out in order to assess whether:

- The output was consistent with the goals set under Phase-I of the National Highways Development Project and timely good value for money was realised from the project;
- The management of the project by NHAI was efficient to safeguard against possible risks to the economy and efficiency of the project and whether NHAI carried out transparent risk assessment associated with various procedures and stages in planning, contracts, quality assurance and control and contract management to enable it to put in place measures to address them;
- The management's interventions and oversight within NHAI, particularly in relation to the high-risk outsourced functions were persistent and effective to afford additional safeguard against deficient performance and quality of output and service by various agencies;
- NHAI has put in place systems and procedures to afford it a framework to assess comparability and reasonableness of the estimated and actual cost of the works and the quantities of items in different stretches in terms of per unit length of the highways, factored by special soil and other conditions obtaining in different stretches;
- The internal control system in NHAI was sufficiently sensitive to highlight variations in the estimated and actual cost and quantities of material per unit and NHAI management addressed the aberrant situations in time to prevent unacceptable variations;
- NHAI was perceptive to the quality assurance procedures and controls and maintained effective oversight to ensure that the systems for quality assurance and quality control were robust and verifiable, the compliance by the PSCs and the works contractors to the procedures provided assurance of quality;
- Internal control and accountability within NHAI provided sufficient assurance for safeguarding the financial interest of the organisation; and
- NHAI maintained its accounts on commercial principles in consonance with the Generally Accepted Accounting Practices (GAAP).

1.6 Audit Methodology

The sample Audit was conducted during June-August 2002 as the risk with this project was perceived to be high in view of the absence of standardised operational, administrative and financial procedures, contract documents and practices despite operationalisation of NHAI in 1995, lack of skill development/know-how/organisational capabilities, high discretionary powers, enormity of the mandate and the need for time bound completion.

The pilot study covering a sample size of six PIUs revealed irregularities with financial implications of about Rs.198 crore after which detailed review on implementation of NHDP Phase-I by NHAI was taken up in audit.

The sample of 32 stretches selected for review included all the 21 completed stretches as on 30 June 2002 and all the 11 ongoing stretches where the progress of work was 50 per cent or more. The audit conclusions drawn by comparing the non compliant cases against the sample were representative of the total population at that time. Thus a balanced picture by including successful cases of implementation was obtained.

The review guidelines were prepared with technical inputs from Consultants M/s Central Road Research Institute (CRRI).

The Consultants' terms of reference covered the following services:

i. Preparation of detailed guidelines for the technical aspects and records to be seen during audit,

ii. Carrying out technical inspection of selected stretches of NHs and

iii. Providing technical guidance during the course of audit.

The following methodology for technical inspection was adopted:

i. Scrutiny of the quality control and assurance data/records and identification of locations for observation test pits for excavating samples for checking their compliance with the contract specifications.

ii. To check the procedure adopted for the approval of road construction materials, such as soil, aggregate, bitumen and other materials.

iii. Physical verification of pavement crust thickness in the field by making observation test pits.

iv. Checking the in-situ density of different pavement layers.

Extracting cores from bituminous layers to check the quality of work and specification conformance.

v. Laboratory evaluation of construction materials excavated from the observation test pits, in CRRI laboratory for checking their conformity with the contract specifications.

vi. Preparation of Technical Inspection Report.

The Ministry in its reply (April 2005) stated that the audit observations were based on inadequate samples and process of standardising system and procedures had only just begun.

In this connection it may mentioned that of the 32 stretches selected for audit, a sample of seven stretches was selected for technical audit. Care was taken to select the stretches based on the degree of completion as well as geographical location. The sample selection by CRRI for technical examination was based on randomly selected pit locations. The extracted material from the pits was tested in accordance with relevant standards without damaging the aggregates. The quartering technique or sample divider as per Indian Standard code meant for extracting representative samples from pile of aggregates was used. The sample constituted representative sample of actual in-situ material. The device used was well-established, internationally accepted and widely used the world over by highway professionals. Since the aggregate population from the batching plant under single Job Mix Formula was homogeneous the sample tested was true representative of the material used. Technical specifications forming a part of the contract were the criteria used for acceptance/rejection. It may also be mentioned that the samples selected in audit related to the period from March 1997 to September 2001. Standardisation of the systems and procedures had not commenced till June 2002.

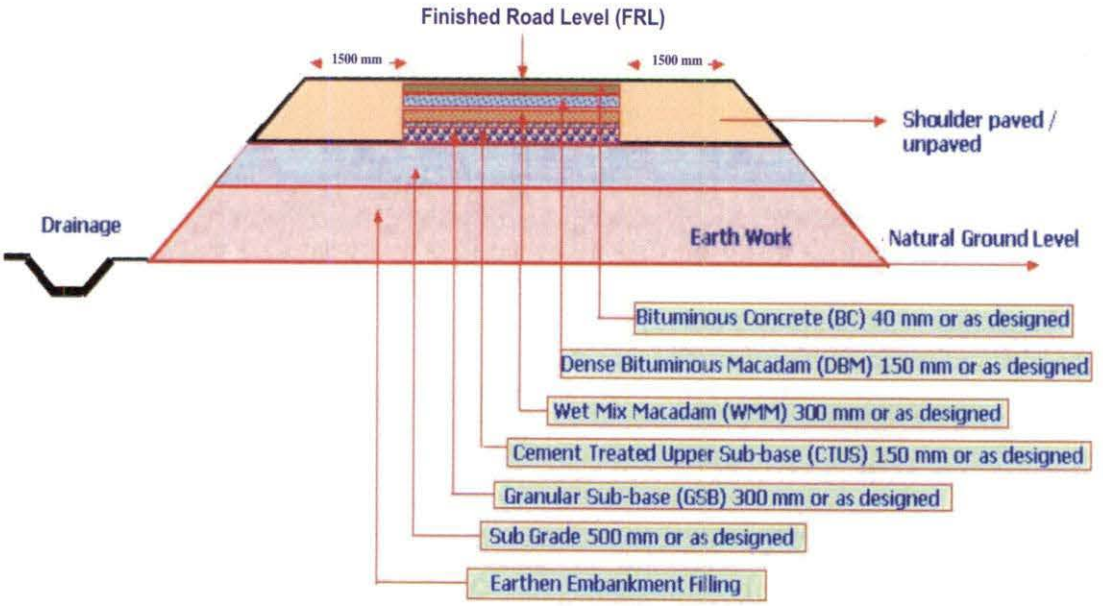
1.7 Road Construction Process

Implementation of NHDP consists of four laning of existing single/double lane roads. The work involved in road construction, which was audited, was as follows:

1. Filling of earth as per the alignment/design
2. Construction of sub-grade
3. Construction of granular sub-base (GSB)
4. Construction of cement-treated upper sub-base (CTUS)
5. Laying of wet mix macadam (WMM)
6. Laying of dense bituminous macadam (DBM)
7. Laying of bituminous concrete (BC)

The process chart depicting these stages is as under:

ROAD CONSTRUCTION PROCESS CHART



CROSS-SECTION OF TWO LANE CARRIAGEWAY

1.8 Acknowledgement

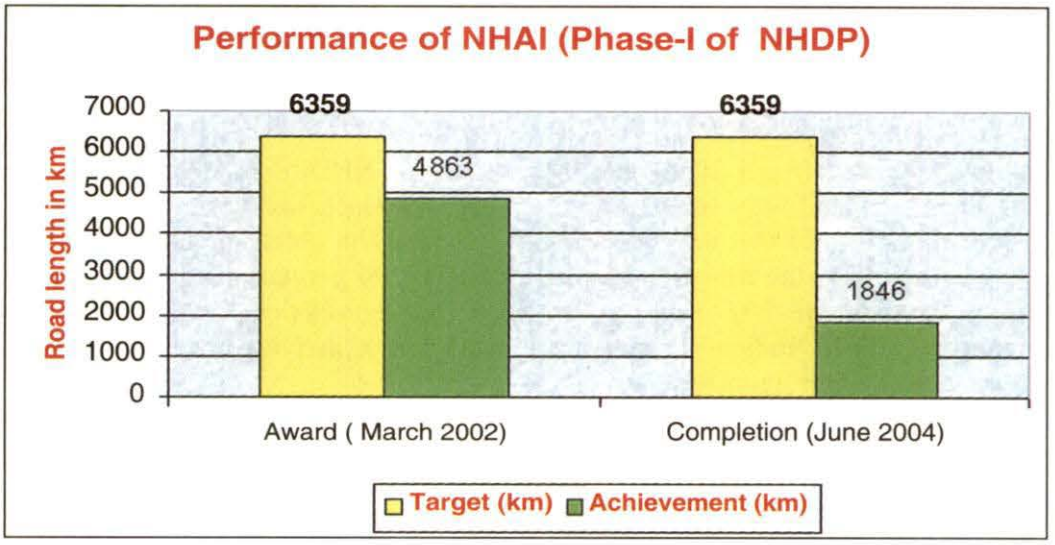
The audit programme, methodology and audit objectives were discussed in the entry conference with the Member (Finance) of NHAI in May 2003 and in several meetings during the course of audit. A presentation on the audit findings was made in April 2004. Management's response was received and exit conference was held in June 2004. The cooperation of NHAI during the meetings and course of audit is acknowledged. The draft review report was issued to NHAI in July 2004. NHAI furnished replies in August 2004. Based on the replies, observations with financial implication of over rupees ninety crore were settled. The Audit Report incorporating NHAI's views was issued to the Ministry in December 2004. An Exit Conference was held in April 2005 with the Secretary, Ministry of Shipping, Road Transport and Highways to obtain the views of the Ministry. Reply of the Ministry was received on 19 April 2005.

CHAPTER 2

Performance

2.1 Completion of National Highways

NHAI was required to award the contracts for entire length of 6,359 km (Phase-I) by March 2002 and complete the execution by June 2004 in a phased manner by fixing yearly targets as per the Government approval (December 2000) **(Annexure-II)**. Against this target, NHAI could award contracts only for a length of 4,863 km upto March 2002 and 5,628 km upto March 2004. Contracts for 380 km were not even awarded upto the due date for completion (June 2004). A bar chart indicating Targets and Achievements is as under:



Out of 175 stretches of 6,359 km of NHDP Phase–I, only 57 stretches involving 1,846 km only (29 per cent) could be completed upto June 2004. These included contracts for 847 km already awarded by the Ministry of Shipping, Road Transport and Highways (MoSRTH). The total completed length was 2,583 km (41 per cent) if partially completed stretches were included. This was far short of the target of 6,359 km.

Corridor-wise achievement in completion of works in respect of Delhi-Mumbai, Mumbai-Chennai, Chennai-Kolkata, and Kolkata-Delhi corridors upto June 2004 including 847 km implemented by other agencies was 71 per cent, 33 per cent, 25 per cent and 24 per cent respectively. As a result, the corridor concept where the entire road length joining the metros becomes a fast lane with no bottlenecks was yet to emerge. The completion for the above four corridors was 82, 46, 45 and 25 per cent respectively, if partially completed stretches were taken into account.

Audit had selected 32 stretches, out of which 27 were completed. Of the completed projects, seven were completed before time and seven on time. Thirteen stretches suffered delays ranging from one to twenty eight months (average delay of 10 months). Five stretches out of 32 stretches audited were yet to be completed. These five stretches had already suffered delays ranging from five to ten months. (October 2004). The cost over-run on the 27 completed stretches, including additional items, amounted to Rs.692.62 crore i.e. 22 per cent over their awarded cost (**Annexure III**). **The delays in completion of stretches had adverse impact on toll revenue, traffic synchronisation, corridor effect and benefits to road users.**

The slow progress of works in eight stretches was attributable to inability of contractors to mobilise resources and ineffective contract management by NHAI /PSCs (five stretches). Incorrect and incomplete data in the Detailed Project Reports (DPRs) led to delays in decision making. With the present pace of progress of works, NHAI expected (August 2004) that 97 per cent work of NHDP Phase-I would be substantially completed only by the end of December 2005 and the final completion would be by December 2007. The delay in execution of NHDP Phase-I by 18 months (computed with reference to June 2004) would result in loss of opportunity toll revenue to the extent of Rs.562 crore. This is with reference to the minimum expected toll collection of Rs.500 crore per annum for GQ (5,846 km).

The Ministry stated (April 2005) that the progress of NHDP was dependent on State Governments for land acquisition, utility shifting etc. which was beyond the control of NHAI. It further stated that delay was also due to delay in obtaining approval from the funding agencies. **At the time of approval of NHDP, 90 percent of the land required was already available. NHAI was yet to resolve bottlenecks even after five years of launching of NHDP, indicating non-synchronisation of activities and ineffective co-ordination with other agencies.**

2.2 Impact of Delay

The delay in completion would also result in non-accrual of perceived benefits in terms of vehicle operating cost to the extent of Rs.4,289 crore (ending December 2005) to the road users and loss of savings in time and avoidance/reduction in accidents. Since the project cost was partly met out of borrowings, NHAI was required to meet maintenance expenditure out of toll income. **The slow progress of implementation resulted in loss of toll revenue. With insufficient income the special maintenance of these high cost assets would become difficult.**

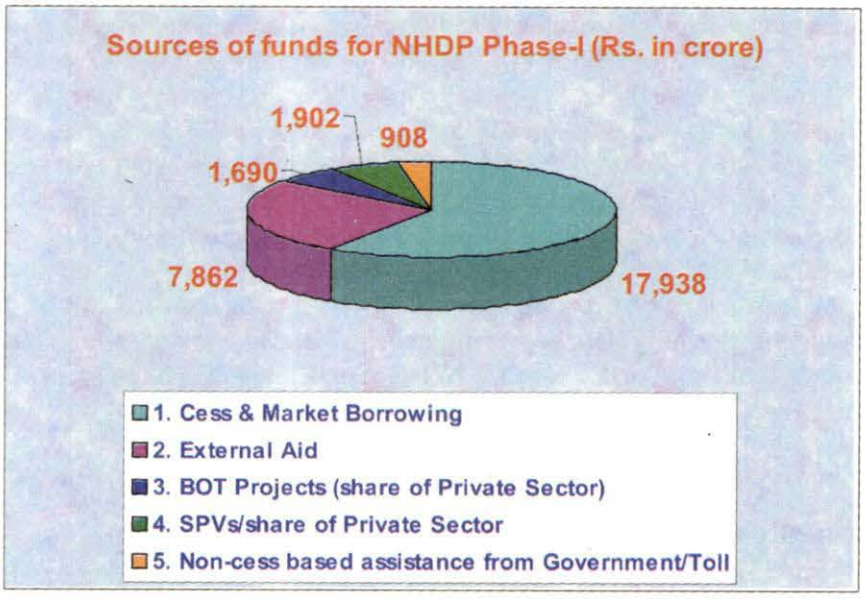
The Ministry stated (April 2005) that the loss of toll revenue and loss to road users were notional. **The fact remained that there was delay in accrual of benefits to the road users and loss of toll revenue as projected at the time of project approval and hence are irrefutable.**

2.3 Funding of Project

The Government approved (December 2000) the funding pattern for Phase-I of NHDP and other works as follows:

	Source of funding	*Amount* (Rs. in crore)
1.	Cess & Market Borrowing	17,938
2.	External Aid	7,862
3.	Build Operate Transfer (BOT) Projects (share of Private Sector)	1,690
4.	Special Purpose Vehicles (SPVs)/share of Private Sector	1,902
5.	Non-cess based assistance from Government/Toll	908
	Total	**30,300**

NHAI projected (June 2000) a cash flow proposal for approval. The cash flow indicated a cash surplus of Rs.13,239 crore by the end of the year 2011-12 based on the assumption that the funds from Central Road Fund (CRF) as Cess would flow as capital grant at the rate of Rs.2,010 crore per annum with a cumulative annual growth rate (CAGR) of seven per cent.



Analysis of cash flow projections indicated that against the projected capital grant of Rs.10,116 crore during the five years ended 2003-04, NHAI received Rs.8,925 crore only. NHAI's proposal was not based on individual DPRs in respect of 40 sub-projects included in NHDP Phase-I and was hence unrealistic. There was a shortfall in provision of interest during construction (IDC) by Rs.725.50 crore in the estimate of NHAI itself.

External assistance (Loan portion) from International Funding Agencies received through Government comprised 80 per cent grant (Rs.6,289 crore) and 20 per cent loan (Rs.1,573 crore). The loan portion was to be serviced by NHAI out of its own income. As the income of NHAI was barely enough to meet its administrative expenditure during the years from 1999-2000 to 2003-04, servicing of the loan would not be possible in the coming years.

At the time of approval of NHDP, NHAI proposed to implement BOT/Annuity Projects with an estimated investment of Rs.1,690 crore being the share of private participation for 287 km. Against this, contracts for 476 km at a cost of Rs.2,354 crore were awarded.

The anticipated toll revenue of these projects was Rs.173.74 crore per annum against the committed annuity outflow of Rs.288 crore (calculated at maximum projected traffic volume of 25,000 vehicles per day and toll revenue of Rs.0.40 per km per vehicle as envisaged by NHAI). This indicated a deficit of Rs.114.26 crore per annum for 15 years commencing from 2004-05. Undischarged liability towards loans from Government and annuity payments for the balance period would amount to Rs.1,940.62 crore at the end of 2011-12.

The projected cash surplus of Rs.13,239 crore in Phase-I by the end of 2011-12 is thus not likely to be achieved and there is high probability of NHAI suffering cash deficit at the end of 2011-12 besides undischarged liabilities to the extent of 1,940.62 crore. This would accrue as NHAI did not factor in the expenditure on annual repair estimated at Rs.450 crore (1999-2000); periodical special repairs estimated at Rs.2,281 crore (2008-2009) both with CAGR of 6 per cent; direct loan of Rs.810 crore and interest thereon at 6 per cent per annum; shortfall in Interest During Construction Period (IDC) and annuity payments to the concessionaires.
The Ministry stated (April 2005) that the cash flow was prepared primarily to ascertain if the implementation of the program was possible through the projected sources of finance. It excluded element of escalation in project expenditure and the project cost would be within the limits of approved cost by PIB. Further no cash crunch was anticipated. **NHAI would be forced to service the loans provided by the Government out of toll income since it would be the only source of income that would accrue. Repayment of loan and maintenance out of toll income by NHAI would, however, not be possible unless Government assures additional financial support.**

2.4 Toll Revenue

There was a loss of toll revenue of Rs.42.23 crore **(Annexure-IV)** in respect of four stretches due to delay in issue of gazette notification (Rs.4.62 crore), late handing over of site (Rs.4.05 crore), non-finalisation of site for the toll plaza (Rs.30.75 crore) and law and order problem (Rs.2.81 crore). The Ministry stated (April 2005) that the delays were either procedural or beyond the control of NHAI and that the loss was marginal. **Proper planning and timely action could have avoided these delays and loss of revenue.**

2.5 Quality of work executed

The quality of road constructed by NHAI was not found to be as per technical specifications in seven stretches test checked for quality. The civil contractors did not

execute the roadwork as per the contracts and it was found that reinforced cement concrete (RCC) work in retaining wall and cement concrete kerb were sub-standard in two cases. The weep-holes provided in retaining walls for allowing water to escape without damaging the structure were not provided as per the technical specifications in four stretches.

Various road layers were not compacted to the required degree and their thickness was also less than the required thickness in some cases. This may not only lead to early settlement and rutting of the road surface but may also not be able to withstand the traffic load as per the pavement design. Some of the tests on the material used for road construction were either not performed or they failed the tests for suitability. The unsuitable material used may not provide the desired structural strength and may result in reduced pavement life.

River shingles used in wet mix macadam (WMM) for service lane did not meet the technical specifications in one case. Some of the required tests for fractured faces and sand equivalent were not conducted to ensure suitability in bituminous concrete.

NHAI did not make provision of longitudinal drain in three stretches despite recommendation by the design consultant. Even after a light rain, water gets accumulated between the main carriageway and service roads. In the absence of adequate drainage for rainwater and wastewater from adjacent places the water would penetrate into the pavement area from the sides. This may lead to stripping of the bituminous layer, reduce strength and consequently reduce the service life of the pavement.

The works in respect of five stretches executed by the contractors for a value of Rs.40 crore were not conforming to the specifications such as non-provision of wearing course, premature distress due to unsuitable mix, inadequate strength for cement-treated sub-base, construction of tilt/shift beyond tolerable limits and use of inferior grade of Geo Textiles materials (**Annexure-V**).

The Ministry endorsed (April 2005) the views of the Management which stated that the tests were not conducted on the representative samples and hence variations were bound to be there. The average total thickness of the layers was more than the required thickness. **The sample selection by CRRI for technical examination was based on randomly selected pit locations. The sample constituted representative sample of actual in-situ material.**

The fact that some tests on the material used for road construction failed indicated the unsuitability of the materials used. The reduced thickness of layer in the roads was only indicative of the deficient quality as detected in the sample study.

All the seven quality audit report including those areas where the quality was confirmed were endorsed to NHAI. NHAI did not react to these reports. CRRI had quoted IRC standards for testing of quality. The tests were performed as per global standards.

Even after five years of the assignment of NHDP to NHAI, the four metros with four/six laned roads were yet to become free-flow corridors. Full benefit of

development, savings in terms of cost and time of travel and also the revenue generation through toll had not been achieved. The quality of the road constructed was also found to be deficient in seven stretches.

Recommendations

- NHAI needs to prepare a comprehensive, synchronised corporate plan and effect better coordination and convergence among various agencies.
- NHAI may avoid delays in toll notifications through advance planning. The preparations for tolling like putting up of toll plazas, engagement of agency for toll collections etc may be started well in advance so that revenue generation starts on time.
- NHAI needs to improve the monitoring of quality work done by civil contractors.

CHAPTER 3

Preparation of Detailed Project Reports

3.1 Wide Variations

Preparation of accurate and realistic Detailed Project Reports (DPR) for highway project is a critical/foremost activity in planning the activities of road construction. Civil contracts involving 276 km for 20 works awarded prior to 1999 for a total cost of Rs.779 crore were without DPRs. NHAI awarded works on 155 stretches based on the DPRs prepared by the DPR Consultants/other agencies. It was observed that executed cost of projects exceeded the awarded cost of project very widely – from 12.26 per cent to 86.82 per cent in nine stretches indicating unrealistic estimates included in DPRs (Annexure-VI).

The earthwork in excavation in two stretches varied by as much as 6,449 per cent in addition to other items, which varied between 83 per cent and 498 per cent. Similarly, construction of embankment in one stretch varied by as much as 1,08,150 per cent indicating deficient DPRs (Annexure-VII).

In case of one stretch^, wide variations existed between estimated amounts as per tenders and those estimated by DPR consultants indicating that the bids did not take into account the quantities estimated in the DPRs. Further, the actual amount incurred varied widely from DPR and tendered Bills of Quantities (BOQ). In this case both the DPR and Project Supervision Consultants (PSCs) being the same, the deficient quality of DPR submitted by them rendered the expenditure of Rs.37.15 lakh paid for preparation of DPR wasteful.

3.2 Discrepancies

Omission to include correct area of land in land acquisition map prepared by the DPR consultant for the two stretches led to delay in completion by four months in one stretch and revision of drawings for shifting of utilities at an excess cost of Rs.1.01 crore (over BOQ cost) led to delay of nine months in another stretch. Besides, in one more stretch, omission to provide additional land amounting to Rs.25.16 lakh for realignment resulted in delay of 12 months in handing over the site to the contractor. Further, the discrepancy in sub-soil investigation for a bridge for the same project led to delay of six months and excess cost of Rs.1.75 crore.

Inaccurate estimates prepared for another stretch not only led to variation of Rs.15.11 crore but also resulted in execution of additional work of Rs.9.62 crore not provided for in DPR.

In one stretch, discrepant quantification of the number of trees to be felled as per DPR and the actual trees led to a cost variation by Rs.1.08 crore. In the case of another stretch, NHAI, having relied (December 1999) on the estimates prepared by state PWD, executed additional items of work to the extent of Rs.33.26 crore which changed the relative competitive position of the bidders. Had NHAI estimated quantities realistically it would have awarded the work to L-2 bidder and effected a saving of Rs.3.75 crore.

^ *NS1 Jalandhar*

The diameters of foundations for two bridges and design of foundations for three bridges for a stretch had to be changed during execution due to incorrect information provided by the DPR consultants. This enhanced the cost by Rs.12.48 crore, besides depriving NHAI of competitive rates at the time of initial award of contract. There was no provision of longitudinal drains connecting the slab culverts, which rendered the latter non-functional in one stretch.

The Ministry stated (April 2005) that to implement the programme without loss of time NHAI used the DPRs which were prepared by the Ministry/State Governments. The Ministry also admitted that there were variations as pointed out by audit and added that the variations were largely due to change in the scope of the work. It stated that the variations should not be seen in isolation but in totality. It further stated that a number of steps were being taken by NHAI to standardise and improve the quality of DPRs by incorporating penalty clauses in the agreements with DPR Consultant to ensure accuracy of DPRs.

The reply of the Ministry on DPRs is not tenable as DPR is a critical document and use of outdated DPRs does not serve the intended purpose of optimal project implementation. The implementation of the steps stated to have been taken will be verified in the follow up audit. Further the contract being for individual items and not lump-sum the variations need to be analysed individually.

Recommendations

- NHAI needs to frame and issue guidelines/policy directives to the design consultants to ensure uniform design practices.

- NHAI may initiate action against the DPR consultants where deficiencies in the DPRs due to negligence on the part of these consultants led to cost and time overrun.

- Professional Liability Insurance (PLI) with a minimum coverage equal to remuneration for the services should be provided to the client after completion of services.

- NHAI needs to install a system where the DPRs prepared are reviewed before commencement of tendering process so as to avoid large variations, adoption of non-uniform specifications for similar site conditions, poor construction quality and inefficient project management on account of inaccurate information/data contained in the DPRs. Such a review would also ensure that essential components like longitudinal drains are not left out so that the road pavement serves the commuters for their designed life.

CHAPTER 4

Planning of Activities

NHAI did not prepare a corporate plan to implement NHDP. It did not plan and synchronise pre-tender activities and take timely action for preparation of Detailed Project Reports (DPRs) as a measure of prudent planning. Stretches for 1,700 km out of 6,359 km included in Phase-I, were already awarded/approved by the Government. Of the balance 4,659 km, NHAI prepared DPRs for 1,961 km (21 stretches) (August 2000). No DPRs were prepared for 2,698 km by then. **A corporate plan would have ensured coordination/prioritisation.**

There were delays in award of contracts ranging from 1 to 30 months in respect of 30 stretches **(Annexure-VIII)** involving 2,889 km. There were instances of inadequate planning/inequitable tendering, ineffective contract management by NHAI and Project Supervision Consultants (PSC) and sub-standard quality of work executed by the contractors in the implementation of NHDP Phase-I. These resulted in delay in completion of the project and increase in the cost.

The Ministry stated (April 2005) that the slippages were due to reasons beyond the control of NHAI as it was dependent on the support of the State Governments. **The task force of the Government mandated (November 1998) NHAI to implement the NHDP. Therefore NHAI could have planned its activities in advance. But it did not fix any yearly targets in the absence of a corporate plan.** The Ministry also stated that the delay in award of works by NHAI was also due to delay in getting approval of projects by funding agencies like WB, ADB etc. **However, the contention of the Ministry is not tenable as out of 32 stretches there was only one externally funded stretch where there was no delay in award or completion.**

4.1 Acceptance of bids

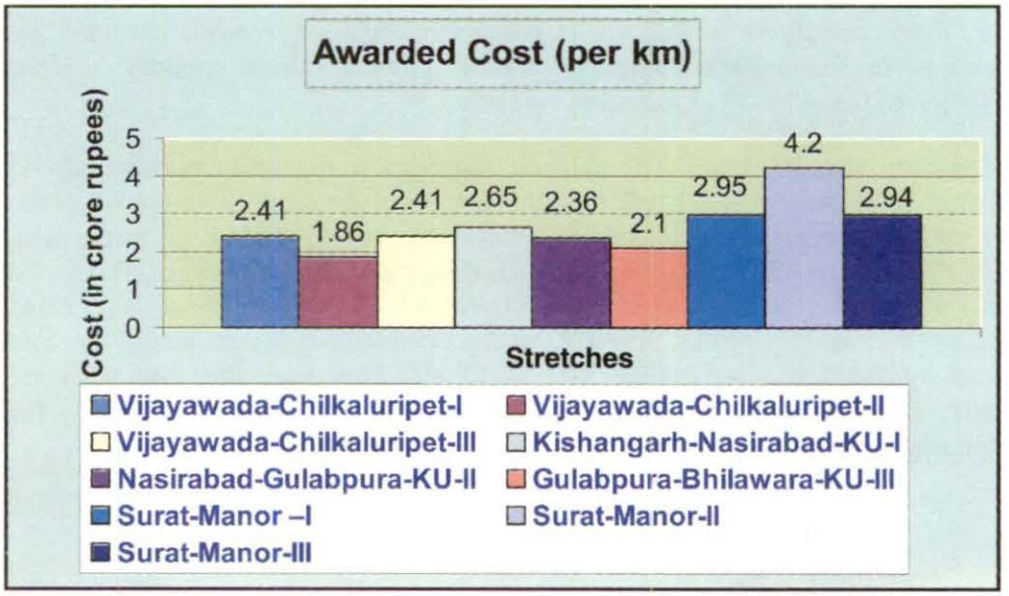
NHAI, after inviting bids from the pre-qualified bidders, should have awarded the contracts at the earliest. The contracts should have been awarded invariably within a period of 180 days as per the time schedule laid down by Government. NHAI delayed the award by two to seventeen months (average delay 5.7 months) after receipt of bids for 10 stretches **(Annexure-III).** This delay was in violation of Government directive and led to avoidable extra cost due to price escalation. The Ministry stated (April 2005) that the procurement activities had been streamlined to minimise the delays. The action taken would be examined in follow up audit.

Recommendation

- NHAI may professionalise its bid evaluation system and award contracts within the validity period to avoid cumulative delays. This would ensure timely accrual of the intended benefit and also avoid additional financial liability due to price escalation.

4.2 Standardisation of stretches

The contracts for widening and strengthening of highways stretches were awarded in length ranging between 5 km and 126 km. NHAI did not standardise the lengths of the stretches for award of contracts to facilitate cost comparison at the time of preparation of estimates, award and execution of works. **An analysis of contracts for nine stretches relating to three sets of contiguous stretches awarded concurrently indicated that the cost per km varied widely from Rs.1.86 crore to Rs.4.20 crore.**



The awarded cost per km varied in respect of these stretches even though these were similar in respect of terrain, number of structures involved etc. The financial impact of such variations amounted to Rs.110.23 crore (Annexure-IX). NHAI did not analyse the reasons for variations. In respect of three stretches in Vijayawada-Chilkaluripet, the same contractor executed the contracts but disparity in rates was noticed resulting in extra expenditure of Rs.26.34 crore.

In the case of tenders for three contiguous stretches the highest rates were accepted for the package where the scope of typically high-rated items of work like bridges (one) and culverts (51) was less whereas the lowest rates were accepted for the stretch with higher number of bridges (two) and culverts (58). Acceptance of the tenders at such varied cost

without any justification resulted in extra cost of Rs.34.46 crore calculated in comparison with the lowest accepted rates.

The Ministry stated (April 2005) that it was not possible to standardise the stretches due to various factors such as terrain conditions, geometric of roads etc which would vary in each stretch.

Wide variations are indicative of deficiencies in the contract system on account of lack of parameters to ensure and control the contract price per unit length for the projects under similar site conditions. Non-standardisation of stretches and cost even after five years of implementation of NHDP was not in line with the Government directive (August 2000) that NHAI should analyse cost of projects along with comparative cost of latest awarded/approved projects on a like-to-like basis and to give specific justification for substantive variations. In absence of possibility of standardisation of stretches, the NHAI should have in the alternative devised an effective cost control system so that the kind of variance pointed out in audit could be addressed.

CHAPTER 5

Preparation of Contract Documents

The contract documents were not prepared with due care as there were inconsistencies in various clauses:

5.1 Variation clause

In the case of one stretch, Conditions of Particular Applications (COPA) forming part of the agreement stipulated that no change in the rate or price for any item contained in the contract would be considered unless such item accounted for more than five per cent of the contract price and the actual quantity of the work executed under the item exceeded or fell short of the quantity set out in the Bill of Quantity (BOQ) by more than 25 per cent. In another case this condition was different and stipulated that the rates would be considered for revision if the item accounted for more than two per cent of the contract price and the quantity increased by more than 25 per cent.

During actual execution of both these packages, although quantities for some items increased beyond 25 per cent, NHAI did not re-fix the rates and instead paid the increase in quantity at the BOQ rates. The Ministry stated (April 2005) that BOQ cost of these items was less than two/five percent of contract price and hence no re-fixation was required. The Ministry stated that the conditions had since been standardised. The standardisation carried out would be examined in follow up audit.

5.2 Price escalation clause

In the provisions relating to price escalation in the contracts for three stretches, the escalation clause provided for the value of work to be considered for calculating the amount of variation to be inclusive of value of materials on which secured advance was granted and to exclude value of materials for which secured advance was recovered. The formulae for calculation of price variation for labour, materials etc. shown separately in the contracts defined this without including value of materials on which secured advance had been granted, rendering the contract provisions mutually repugnant. Further NHAI omitted to stipulate the inclusion of value of material for material advance while calculating price escalation in 15 out of 32 stretches. The Ministry stated (April 2005) that the two stipulations are in consonance with each other. **The fact remains that there was a difference in stipulations leading to different interpretations needing congruity.**

5.3 Recovery clause for Mobilisation Advance

The provision in agreements of seven stretches with regard to recovery of interest-free advances for mobilisation (10 per cent of contract price) and equipment advance (5 per cent of contract price) had been so worded that the recovery could not be effected during the currency of the contract. This situation may not only result in delay in the recovery of advances but may also lead to contractual/legal complications.

The Ministry stated (April 2005) that bid documents had since been standardised to ensure complete recovery of advance. The standardisation carried out would be examined in follow up audit.

5.4 Standardisation of Bill Of Quantity

Laying of bituminous course commences after completion of excavation of earth work, sub-base and base course which ensures the evenness of the surface. Standardisation of bituminous layer quantity per km hence becomes possible. **In 23 stretches the quantities per km of bituminous course and shoulders varied widely (Annexure-X). The quantities of bituminous work varied from four per cent to 1,280 per cent in these stretches. NHAI had not standardised the quantities in respect of similar works resulting in extra expenditure of Rs.260.98 crore, calculated with reference to the lowest quantity per km.**

The Ministry stated (April 2005) that it was not feasible to standardise the per km quantity of bituminous work as it was determined by the design and thickness of pavement layer in all the packages due to traffic density, type of soil, terrain, climatic conditions etc. It however, stated that uniformity was more or less achieved for the contract packages of Surat-Manor Project.

The thickness of bituminous layer or the volume of bituminous work per km should not vary widely especially between adjoining stretches where sub-grade soil and traffic load would be similar. **Such uniformity was achieved in Surat-Manor stretches. This also leads to the inference that the DPR consultants worked in isolation and therefore different combinations of bituminous layers had been recommended by them, leading to wide variations in the bituminous quantities.**

The Management stated (August 2004) that a Committee had been constituted to finalise model contract documents relating to PSCs and Civil Contracts. The model documents finalised would be examined in follow up audit.

Recommendations

- NHAI may standardise the contract documents so as to exclude possibility of subjectivity.
- NHAI may review the contract provisions and remove anomalies with regard to recovery of advances.

CHAPTER 6

Tender Evaluation System

NHAI did not follow uniform system for tender evaluation. It awarded two bids to second lowest bidders at their bid prices not following its practice to urge the second lowest bidders to match their rates with the lowest bidders who could not qualify due to lack of bid capacity. This departure from normal practice resulted in excess cost of Rs.16.95 crore. The Ministry stated (April 2005) that the clauses for evaluation did not provide for negotiation with the contractors. The reply is not acceptable in view of the fact that NHAI had got the rates of L-2 matched with L-1 in other cases (Delhi Border-Samalkha and Guwahati bypass).

In another case, a contract was awarded to the second lowest bidder incorrectly rejecting lowest bid through erroneous evaluation of bid capacity resulting in an excess cost of Rs.7.47 crore. The Ministry stated (April 2005) that the bid capacity was fixed based on estimated cost as per preliminary project report. The reply is not tenable as eligibility of any bidder for the award of any contract is determined only when available bid capacity was more than both the preliminary estimated cost of the work and the final estimates as per DPR.

NHAI erroneously evaluated bids including Provisional Sums and Day Work in the bid prices. However, the bids were accepted for the amounts excluding these provisional sums and day work. The mutual competitive position of the bidders changed in three stretches and resulted in extra cost of Rs.3.53 crore. The Ministry stated (April 2005) that the clauses for evaluation of these specific contracts provided for evaluation by including provisional sums and day works. The reply justified audit stand of adoption of different practices for evaluating different tenders indicating inconsistency leaving scope for subjectivity in preparing and awarding tenders. The Ministry further stated (April 2005) that the NHAI had since standardised the bid documents, which are now in practice. This would be examined in follow up audit.

The Government exempted (August 1995) all goods supplied and machinery used in projects approved by it and funded by multilateral lending agencies like the World Bank and Asian Development Bank from levy of customs/excise duties. While calling for bids for stretches funded by the World Bank, NHAI failed to include a clause in the notice inviting tenders that the bidders should quote the prices excluding customs/excise duties as exemptions were available to them. The Ministry stated (April 2005) that the bidders were aware of the exemption and the benefit of excise duty would not be available to them in respect of claims towards price escalation. The reply is not tenable as the provisions for payment of price escalation, incorporated in the agreements did not provide for exclusion of excise duty element from the basic price of raw material agreed to. **The omission resulted in NHAI not getting the benefit of duty element and resultant lower cost. NHAI issued exemption certificates to five contractors, after finalising the contracts for availing the duty exemption but could not recover the proportionate duty element from the bills of the contractors in the absence of**

necessary stipulation. This resulted in undue benefit of Rs.30.69 crore to these five contractors.

Recommendation

NHAI may devise vendor development policies and framework so that better competition in terms of cost could be obtained.

CHAPTER 7

Contract Management

7.1 By National Highways Authority of India

7.1.1 System of obtaining/revalidating Bank Guarantees

NHAI did not have a reliable system/mechanism of verifying the credentials of the bidders and keeping the Bank Guarantees (BGs) valid through periodical renewals to avoid their expiry. This resulted in legal complications and contributed towards loss. NHAI could not effect recovery of Rs.14.14 crore in terms of contract clauses from a contractor as it did not keep the BGs submitted by the contractor alive for the required period. In another contract, the contractor submitted forged BGs and obtained payment of interest-free advance from NHAI. NHAI could not make recovery of Rs.10.30 crore because there was no security available with it. The Ministry stated (April 2005) that NHAI had strengthened the system of verification of bank guarantees. **Had there been a robust system of timely renewal of BGs in place, the recovery could have been effected without loss of time/interest and legal complications. NHAI continued accepting forged BGs upto July 2004.** The strengthening of system of verification would be examined in follow up audit.

7.1.2 Payment of escalation

The contract provision in respect of 17 stretches with regard to regulation of price adjustment due to price escalation was inconsistent with general conditions of the contract. Eleven contracts provided for price escalation on all permanent works, variation items, and day works. Two contracts provided for escalation on permanent works and variation only. Fifteen contracts provided for price escalation on variations only. The contract conditions incorporated in these contracts with regard to payment of price escalation were ambiguous since there remained confusion about their interpretation. The inconsistency in the price escalation clause of the agreements led to different interpretation with regard to admissibility of price adjustment under various categories. Every bidder would normally expect all standard clauses to be interpreted as per FIDIC model. NHAI erred in making different provisions in the contracts by not adhering explicitly to standard conditions. NHAI initially withheld price escalation but subsequently released payment of Rs.120.08 crore against receipt of Bank Guarantee. This could have been avoided had NHAI adopted uniform and unambiguous contract provisions/clauses for all these contracts. **Price escalation was paid in total disregard of the opinion of the Ministry of Law (April 2004) that no price escalation was payable as per the provisions of the agreement.**

The Ministry admitted (April 2005) that the omission was due to discrepancy.

NHAI provided for price adjustment in 17 stretches due to escalation in unit rates without deducting profit elements from these rates. Thus the flawed provision provided for payment of price adjustment on 100 per cent value of work done. Defective contract conditions resulted in avoidable overpayment of Rs.4.57 crore in case of two stretches* (December 2003). **There was thus no uniformity in conditions provided in the contract to protect the financial interest of NHAI.** The Ministry stated (April 2005) that NHAI had since standardized these conditions in the bidding documents. The revised bidding documents would be examined in follow up audit.

7.1.3 Execution cost

Extra payment of Rs.7.20 crore was made in respect of one stretch for levelling and reconstructing existing road surface in the name of new construction, design review, and future expansion. The Ministry stated (April 2005) that PCC was provided to rectify cross and vertical undulations. **The payment of Rs.6.23 crore was not backed by traffic density data. Payment of Rs.96.96 lakh was made for profile correction course (PCC) with wet mix macadam (WMM) etc. without considering cost for excavated material resulting in avoidable extra payment.**

7.1.4 Consultancy charges

The Government had instructed (December 2000) NHAI to restrict consultancy charges to six per cent of contract price. NHAI did not evolve standardised price evaluation criteria resulting in failure to restrict the cost of supervision consultancy to six per cent. The actual percentage ranged between 1.49 and 11.16 in 32 cases. The contracts for consultancy were finalised on the basis of remuneration of technical/non-technical staff engaged by the PSC and their house rent, office accommodation and communication. **No standardised proforma was devised or adopted. Higher cost of supervision consultancy in excess of Governmment's approval resulted in extra cost of Rs.22.35 crore in 12 stretches worked out with reference to the ceiling of six per cent.**

The Ministry stated (April 2005) that in few cases the percentage of supervision cost exceeded the ceiling prescribed by Government but the overall percentage was 3.2 only. **As the six per cent ceiling limit was for individual stretches and not for overall cost of the project, the payment in excess of the percentage was not in line with the Government directions. NHAI further paid Rs.1.76 crore without ensuring production of supporting vouchers, resulting in extra payment to the consultants.**

7.1.5 Payment of advances

Additional mobilisation and machinery advances were paid to three contractors in contravention of the provisions of contracts resulting in financial aid not contemplated in the agreements. Further, the recovery of additional advances of Rs.2.06 crore to one contractor was deferred by three months.

The Ministry while admitting (April 2005) that the payment of advances was outside the scope of contract added that it was made in the interest of the work. Further, additional

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* ***Surat-Atul and Atul-Kajali***

mobilisation advances were given at the Prime Lending Rates of the State Bank of India against Bank Guarantees. **Payment of advances to selected contractors violated the agreed terms and conditions as per the contract and was inequitable to other contractors who could not compete due to financial incompetence.** The three stretches where this benefit was extended had still suffered a delay of nine to eleven months and remained to be completed (November 2004). NHAI stated that the issue was being examined for regulating the release of advances as per the progress of the work. The outcome would be examined in future audit.

7.1.6 Release of retention money

NHAI permitted (September 2002/December 2002) premature refund of the retention money against Bank Guarantees in violation of agreed terms and conditions contained in the contracts. It arbitrarily made these releases without charging any interest upto July 2003 and thereafter interest at six per cent per annum was charged. Extra financial assistance of Rs.57.72 was provided to 12 contractors. This also resulted in loss of interest of Rs.1.33 crore.

In another case retention money amounting to Rs.2.70 crore was released without adjustment of outstanding amount of secured advance of Rs.1.63 crore. The action of NHAI violated the sanctity of the tendering process as also the concept of equity for unsuccessful bidders and resulted in loss of public money by way of loss of interest. The Ministry agreed (April 2005) that provisions regarding release of retention money were not contemplated uniformly in all the contracts and stated that the additional financial assistance was provided against bank guarantee after ascertaining the required progress of work. It further stated that this has also been covered in the standard bid document. The outcome would be examined in future audit.

7.1.7 Procurement of Geo-textile Materials

Although the contract provided for re-fixation of rates when the actual quantity exceeded 25 per cent of the BOQ and actual cost increased by more than two per cent of the overall contract price, the condition could not be enforced in a contract as the contractor did not agree for re-fixation of rates. NHAI paid the agreed BOQ rate of Rs.300 per sq. meter for the entire quantity of 2.74 lakh sq meters of geo-textile material already utilised resulting in avoidable extra expenditure of Rs.3.57 crore besides agreeing to bear a future liability of Rs.21.98 crore for the additional quantity required for balance unexecuted works. The Ministry stated (April 2005) that the matter was under arbitration. Outcome of arbitration would be watched in audit.

7.1.8 Grant of extension of time

NHAI granted extension of time (EOT) without invoking the contract provision for liquidated damages (LD) for delays attributable to the contractors.

The Management stated (June 2004) that a number of policy guidelines had been issued standardising the procedures to bring in uniformity in respect of payments to contractors, approval of variations and grant of EOT etc. The Ministry had also constituted a Steering Group (July 2001) for review of existing procedures in order to standardise the

procedures, documents and manuals for implementation of NHDP. The recommendations of the Group had not been implemented due to difference of opinion (December 2003). A joint committee had been constituted to arrive at an agreed formulation.

7.2 By Project Supervision Consultants

7.2.1 Terms of Reference

Project Supervision Consultants (PSCs) failed to demonstrate efficient contract management abilities as non-compliance to contractual provisions resulted in losses and extra payments. The PSCs were required to advise the employer in finalising the claims of the contractors. NHAI authorised (December 2002) the PSC to issue variation orders in individual BOQ item upto one per cent of contract value subject to overall limit of 10 per cent. The PSC, however, issued variation orders for Rs.26.49 crore in one case for BOQ and non-BOQ item against the contract value of Rs.146.97 crore in violation of the mandate. The agreement with the expatriate PSCs provided for transfer of technology by arranging training which was not arranged.

7.2.2 Liquidated Damages

Despite contractual requirement for recovery of liquidated damages for delayed execution attributable to the contractors, the recovery was not proposed resulting in non-levy of Rs.51.49 crore in respect of five packages as detailed in Annexure-XI.

7.2.3 Payment for variation items

The PSC ordered execution of variation items in respect of two stretches[@] without the prior approval of NHAI and also at rates higher than those subsequently approved by NHAI, resulting in overpayment of Rs.5.89 crore which could not be recovered from the contractors. The Ministry stated (April 2005) that the matter was under arbitration. Outcome of arbitration would be watched in audit.

7.2.4 Mandatory tests

The PSC did not conduct 8 out of 14 mandatory tests in two stretches. The modified bitumen used at site failed four out of seven tests conducted by technical audit. There was nothing on record to show that PSC approved WMM design before use. The failure of material in mandatory tests conducted by technical audit indicated sub-standard work by the contractor under the direct supervision of the PSC defeating the purpose of engaging highly qualified PSC engineers.

The Ministry stated (April 2005) the test certificates by the refineries had been relied upon. **There was no provision in the agreement to rely on the manufacturer's certificate and not conducting independent quality tests. Further, large distance and time gap between the material leaving the refinery and getting used in work was fraught with possibility for manipulations.**

[@] *Sl. No.4 and 19 of Annexure-III*

The PSC was contractually bound to obtain quality assurance plan/procedure from the civil contractor and ensure its execution but the PSC failed in his duty in this regard. The PSC also failed to follow the procedure as it allowed unapproved sub-contractor, contravening the contract conditions, to work on a bridge which later collapsed. Extension of Time (EOT) cases were initiated very late in two stretches and for long time periods there were no valid contracts between NHAI and the contractor due to not granting EOT with or without levy of LD. NHAI neither deferred levy of LD nor levied it after scheduled completion date. No objective analysis was done by PSC while recommending EOT. The recommendations were arbitrary and not based on any data such as weather report. Further, the PSC delegated his powers to the Engineer's Representative who delegated them to other key professionals, involving a delay of six months to seven months after the commencement of the services. Payments were made to the civil contractor without any authorised representative approving the works on day-to-day basis at site of the works. The PSC did not get all the laboratory equipment calibrated for accuracy. The PSC also failed to prevail upon the contractor to procure some testing equipment. **The contractor did not demonstrate the utilisation of advance payment received of equipment, plant and mobilisation.**

7.2.5 Key personnel

The key personnel mentioned in the bid documents based on which the bids had been evaluated and awarded were either not mobilised at all or were frequently replaced in nine stretches compromising the quality and continuity of supervision. In other cases the details of replacement of key personnel were not made available to audit.

The Ministry stated (April 2005) that the key personnel were replaced with the approval of the competent authority for reasons beyond their control like leaving the site due to personal problems or law and order. The reply is not acceptable since the offers were made for specific stretches keeping in view the work site and associated problems.

Since the selection of consultants was based on the credentials of key personnel to be made available during execution, any change not only affected the continuity of supervision / guidance but also vitiated the original bid to that extent.

NHAI realised that major omissions by consultants led to substantial time and cost overrun in the projects and that in some cases their negligence might lead to contractual complications. A committee had since been constituted (July 2003) to identify the contracts where progress had been very slow for initiating action against such contractors for future contracts. The Ministry stated (April 2005) that a process had been initiated to take appropriate action against the erring PSCs and additional security provisions/ penalties were being introduced. The additional provisions made would be examined in audit for effectiveness.

Recommendations

- The computation of price variation should be uniform across the contracts and should take into account the value of material on which advance had been paid so that price escalation is not paid for the period the material awaits use in work after purchase.

- NHAI may strengthen its monitoring and deterrence mechanism for enforcing compliance of the contract conditions/specifications by Project Supervision Consultants as well as the civil contractors in order to ensure that all quality assurance requirements are complied with, mandatory tests conducted and suitable materials used in road construction.

- Prompt, deterrent action should be taken against the contractors and Project Supervision Consultants, which would instil a sense of seriousness and improve the pace of implementation.

- Fix bid capacity for PSCs and ensure the same key personnel are not proposed for multiple projects

CHAPTER 8

Overpayments

8.1 Payment of price variation

Inadmissible payments for price variations were made leading to overpayments of Rs.13.23 crore in violation of the contract conditions (Annexure-XII). The Ministry stated (April 2005) that procedure for approval of variations at prescribed rates would be included in future contracts and would ensure that the provisions contained in civil contracts were not at variance with those contained in PSC contracts.

Procedure for approval of variations included in future contracts would be examined in follow up audit.

8.2 Payment of provisional sums

The rates quoted by the bidders for the provisional sums were not regulated during the execution of the works so as to justify their reasonableness with market rates. This led to excess payment of Rs.10.76 crore due to not matching the rates quoted with market rates (Annexure-XIII).

The Ministry stated (April 2005) that the issue of PSC's powers to fix the rates of provisional sums without seeking employer's approval had been referred to arbitration. Outcome of arbitration would be watched in audit.

8.3 Reimbursement of Royalty

NHAI paid Rs.4.22 crore to the contractors in respect of two stretches on account of reimbursement of royalties of various materials, which were already included in the price variation payments. The Ministry agreed (April 2005) to recover the over- payments.

Progress of recovery will be watched in audit.

CHAPTER 9

Other Points of Interest

9.1 Delayed decision

NHAI did not take timely action in foreclosure of the contract with a toll-collecting agency that defaulted in its payments as per the terms of agreement. This resulted in non-recovery of Rs.31.26 crore. In another case, despite a toll plaza existing within 50 km in case of two stretches, provision was made in the agreement for the construction of another toll plaza. NHAI took a belated decision to delete it from the scope of work when rigid pavement in the toll plaza area had already been constructed at an additional cost of Rs.5.44 crore.

The Ministry stated (April 2005) that the toll plaza could be used in case of future widening of roads. **As there was no proposal for such widening till date, such possible use appeared remote.**

9.2 Parking of funds

NHAI had a cash surplus of Rs.1,769.32 crore (including interest accrued and due) in March 2000. Subsequently, during the three years ended March 2003, it mobilised additional funds through market borrowings to the extent of Rs.7,054 crore through Capital Gain Bonds. These bonds attracted an interest rate ranging from 10.5 per cent to 7 per cent per annum. Bonds amounting to Rs.1,461 crore raised during 2000-01 and 2001-02 were not required as NHAI was having net surplus of Rs.1,602.77 crore ending 2001-02. In the absence of matching financial progress of NHDP, these funds were parked in fixed deposits for which interest (Rs.143.17 crore) and bonds issue expenses (Rs.11.06 crore) to the tune of Rs.154.23 crore were paid. This interest liability on bonds proportionately increased the cost of the project. NHAI subsequently redeemed bonds to the extent of Rs.656.61 crore during 2003-04.

The Ministry stated (April 2005) that there were only minor differences in the rates of interest at which it borrowed and deposited is not correct in view of the fact that the rate of interest earned on these funds ranged between 6.75 per cent and 8.50 per cent against interest payable at 8 per cent to 10.5 per cent resulting in net loss of Rs.77.25 crore due to differential interest rate. **Better financial planning and management could have saved interest outgo of Rs.77.25 crore.**

Recommendations

- NHAI may improve its system of monitoring of tolling agencies so as to pre-empt any attempt at leakage/non-remission of the toll collections

- NHAI needs to regulate borrowings in line with the requirements.

CHAPTER 10

Project Monitoring and Information System

The Management Information System (MIS) report, prepared at head office, consolidated data from PIUs for project monitoring. These did not contain important details like number of projects delayed beyond schedule and the period of delay, number of revisions made in the target date for completion of a project and comparative data of physical and financial achievement to facilitate initiation of decision and corrective action at appropriate time and avoid delays in raising of claims with funding agencies. NHAI spent Rs.10.87 crore* on information systems and claimed to have completed implementation of information systems relating to Project Financial Management System (PFMS), Electronic Drawing Management System, (EDMS), Geographical Information Systems (GIS), Pay Roll Accounting, Human Resource and Inventory Management Systems (HRMS).

The PFMS was, however, not found useful except for generation of trial balance for the transactions carried out at corporate office based on voucher-level transactions captured by the system. NHAI had not identified the functional responsibility for input of data such as physical and financial parameters for execution of work. As a result, the monitoring of highway construction projects sought to be enforced for the organisation as a whole through PFMS was not ensured.

NHAI procured software, which did not match the organisational requirements leading to non-synchronisation of different activities within the software development cycle. Consequently the software required complete modification, rendering the investment of Rs.49.50 lakh on PFMS unfruitful (March 2004).

The Ministry stated (April 2005) that the PFMS was being upgraded to a web-based system on the advise of the World Bank. Efficiency of the upgraded system would be examined in future audit.

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* ***Provisional***

CHAPTER 11

Accounting Practices

NHAI, a body corporate, was required to maintain its accounts on commercial principles. The following accounting practices adopted by NHAI were not in consonance with the Generally Accepted Accounting Practices, pending a decision by the administrative Ministry.

11.1 Capitalisation of the completed works

NHAI was only an implementing agency entrusted to carry out NHDP by the Government. The financing of NHDP works was inter-alia through the Government providing intermediated loans from external funding. NHAI was required to repay the loan portion of Rs.1,573 crore with interest out of toll income collected from the completed stretches after meeting the maintenance expenditure. It completed 39 stretches for a length of 880.21 km valuing Rs.3,079.65 crore as on 31 March 2004. These works continued to be exhibited as Capital Work-in-Progress (CWIP) in the accounts instead of being reflected as deduction equivalent in the value of completed works from its books. Equivalent value from the Cess funds also needed to be adjusted.

11.2 Assets created out of Grants and Loans provided by the Government

Fixed assets created out of grants received for creation of specific assets were not subjected to depreciation. The full value of the fixed assets was to be shown as deduction from the amount of grant or the amount of grant shown as deduction from the fixed assets, as the case might be. NHAI continued to exhibit 11 completed stretches for a total length of 475.46 km valuing Rs.1,804 crore which were funded out of grants and loans received from Government as CWIP. This exhibition of assets created out of Grants and Loans provided by the Government as CWIP is not in accordance with the accounting policy spelt out by NHAI.

11.3 Grants released to BOT concessionaire

The BOT projects are partnership projects of the Government and Private sector and NHAI works as a facilitator to release the grants out of funds provided by the Government. NHAI released Rs.389.08 crore to four BOT concessionaire as on 31 March 2004. These were exhibited as CWIP in its accounts. These grants were not represented by any asset in the books of accounts of NHAI as it did not hold any asset. These amounts should have been treated as reduction from the capital provided by the Government (Cess funds) and should be exhibited accordingly.

The Government had not granted any concession or lease to NHAI for Surat-Manor Project (similar to BOT projects). It had only entrusted the stretches for development. During 2003-04 two out of three stretches were completed (96 km) valuing Rs.537.77 crore and the same were put to use. The total estimated project cost was Rs.1,173 crore.

The total direct loan from ADB to NHAI for this project was Rs.810 crore i.e. loan component was about 69 percent. The Government funded balance 31 percent. For the two completed stretches, the amount of Rs.537.77 crore was to be reduced from CWIP and accounted as receivable to the extent of Rs.371.06 crore. The balance of Rs.166.71 crore was required to be adjusted out of capital. The value of these two stretches was, however, continued to be shown as CWIP.

11.4 Assets obtained during the course of execution of works

NHAI is only an implementing agency. The administrative Ministry had not so far given any direction to NHAI about the ownership of the assets such as PIU buildings, guest houses, computers, cell phones, office furniture etc.

11.5 Interest earned out of unutilised funds

NHAI earned interest to the extent of Rs.1,715.43 crore (March 2004) by parking the unutilised funds in short term deposits. These amounts were credited to the capital. Since this interest income does not form part of the income of NHAI, the entire interest earned was required to be allocated to the capital value of stretches funded out of cess and market borrowings. Treatment of interest income as capital is not an accepted accounting principle.

CHAPTER 12

Conclusions

The Government launched National Highways Development Project during 1998 to remove the deficiencies of the existing National Highways and to offer better riding quality to the road users of the National Highways. It prioritised 6,359 km (Phase-I) under the Golden Quadrilateral and North-South, East-West corridors based on their traffic potential for upgradation by June 2004 at an estimated cost of Rs.30,300 crore.

The performance of National Highways Authority of India in implementing the project did not match the targets as it completed only 1,846 km (29 per cent) of the targeted length by June 2004 (41 per cent including partially completed stretches). The balance works of Phase–I (4,513 km) have been scheduled for completion by the end of December 2005. National Highways Authority of India thus failed to achieve the primary mandate of implementation of National Highways Development Project in a time bound manner.

Time overrun ranging from one to twenty eight months with a cost over-run of Rs.692.62 crore in 13 out of 27 stretches was mainly due to inadequate planning and non-synchronisation of pre-construction activities, lack of co-ordination with Governmental agencies, deficient Detailed Project Reports and ineffective contract management by National Highways Authority of India. Inaccurate contract provisions led to inherent deficiencies in contract management.
The above factors coupled with inefficient performance of supervision consultants and civil contractors resulted in extra payment and affected quality of roadwork. Deficient quality of Detailed Project Reports, use of nonconforming materials and inadequate quality assurance show that the system in place to get value for money had not been effective.

The Management recognised the major causes of under-performance and agreed to take remedial action. It agreed to enforce accountability of Project Supervision Consultants in terms of deliverables in the agreement and invoke penal provisions as a deterrent against their poor performance. A number of steps were claimed to have been taken by National

Highways Authority of India to inculcate the best practices and sound procedure for implementation of National Highways Development Project.

(T. G. SRINIVASAN)
Deputy Comptroller and Auditor General
cum Chairman, Audit Board

New Delhi
30th April 2005

Countersigned

(VIJAYENDRA N. KAUL)
Comptroller and Auditor General of India

New Delhi
2nd May 2005

Annexure-I

(Referred to in Para 1.4)

List of works selected for review

(A) Completed Works Selected for Review

Sl. No.	Name of stretch	Contract value Rs. in crore	PIU	State
(1)	(2)	(3)	(4)	(5)
1.	Agra–Gwalior (NS-4)	40	Gwalior	MP
2.	Agra-Dholpur NS-5)	21	Gwalior	MP
3.	Agra–Gwalior (NS-6)	28	Gwalior	MP
4.	Barwa Adda–Barakar	155	Durgapur	Jharkhand
5.	Chandikhole-Bhadrak	324	Bhubaneshwar	Orissa
6.	Chandikhole-Jagatpur	125	Bhubaneshwar	Orissa
7.	Delhi Border-Samalkha	42	Sonepat	Haryana
8.	Eluru-Vijayawada	312	Vijayawada	AP
9.	Gondal-Ribda	40	Palanpur	Gujarat
10	Gurgaon–Kotputli	308	Gurgaon	Haryana
11	Jaipur Bypass Phase–I	61	Jaipur	Rajasthan
12	Kolaghat–Kharagpur	437	Kolkata	WB
13	Lucknow–Kanpur (EW-2)	33	Lucknow	UP
14	Nagpur-Hyderabad (NS 8 A.P.)	40	Hyderabad	AP
15	Palanpur-Dessa	53	Palanpur	Gujarat
16	Raniganj-Panagarh	184	Durgapur	WB
17	Vijayawada-Chilkaluripet (Pkg-I)	73	Guntur	AP
18	Vijayawada-Chilkaluripet (Pkg-II) including Guntur By-pass	72	Guntur	AP
19	Vijayawada-Chilkaluripet (Pkg-III) including Krishna bridge approach	67	Guntur	AP
20	Vijayawada-Chilkaluripet (Pkg-IV) including Krishna bridge	64	Guntur	AP
21	Westerly Diversion (Pune Bypass)	104	Pune	Maharashtra
	TOTAL (A)	**2583**		

(B) Works Under Execution Selected for Review:

1	Champawati-Vishakhapatnam (AP3)	169	Vishakhapatnam	AP
2.	Gowthami -Gundugolanu (AP 18)	277	Srikakulam	AP
3.	Gulabpura-Bhilwara (KU III)	127	Kishangarh	Rajasthan
4.	Hosur-Krishnagiri	193	Krishnagiri	TN
5.	Jalandhar Bypass (NS-1)	62	Jalandhar	Punjab
6.	Kishangarh-Nasirabad (KU I)	110	Kishangarh	Rajasthan
7.	Nasirabad-Gulabpura (KU II)	151	Kishangarh	Rajasthan
8.	Palasa-Srikakulam	260	Srikakulam	AP
9.	Surat-Manor Project (Pck II)	188	Vadodara	Gujarat
10.	Surat-Manor Project (Pck III)	196	Vadodara	Gujarat
11.	Udaipur-Kesariaji (UG I)	192	Udaipur	Rajasthan
	TOTAL (B)	**1925**		
	GRAND TOTAL (A+ B)	**4508**		

Annexure-II
(Referred to in Para 2.1)

Completion Status

Upto the month	Award of works by NHAI				Completion of works by NHAI			
	Target	Achievement		Balance	Target	Achievement		Balance
	km	km	Per cent	km	km	Km	Per cent	km
Already awarded (Upto Dec.2000)	948	948	100	0				
March 2001	4693	1470	31	3223	480	234	49	246
March 2002	6359	4863	76	1496	690	505	73	185
March 2003	-	5576	88	783	1160	897	77	263
March 2004	-	5628	89	731	5790	1684	29	4106
June 2004	-	5979	94	380	6359	1846	29	4513

Annexure-III

(Referred to in Paras 2.1 and 4.1)

Time and Cost over run

(Rupees in crore)

Sl No.	List of completed stretches	Length in km	Date of opening of Bid/ Submi-ssion of bid	Actual date of award	Delay in award of work in months (excluding six months) as per the Governmen t schedule	Scheduled month of completion	Actual month of comple-tion	Delay in months	Cost as per Award	Actual Expendi-ture Up to August 2004	Cost over run
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	A. Completed										
1.	Agra–Gwalior (NS/4)	16.00	N.A.	N.A.	N.A.	Sept. 01	Nov. 01	2	40.00	45.97	5.97
2.	Agra Dholpur Section	10.00	21/6/1999	8/7/1999	0	March 01	Mar. 01	0	21.00	22.02	1.02
3.	Agra – Gwalior (NS/6)	10.00	18/11/1999	14/2/2000	0	Dec. 01	Jan. 03	14	28.00	33.22	5.22
4.	Barwa Adda –Barakar	42.69	5/1/1996	20/9/1996	2	June 2000	Dec 01	18	155.00	208.54	53.54
5.	Chandikhole-Jagatpur	33.20	9/7/1998	16/10/1999	9	Feb. 03	Jan. 03	0	125.00	141.39	16.39
6	Delhi Border to Samalkha	15.00	21/6/1999	8/7/1999	0	June 01	Nov. 01	5	42.00	42.35	0.35
7.	Eluru-Vijayawada	71.60	5/1/1996	12/11/1997	17	Jan. 02	Jan. 02	0	312.00	347.18	35.18
8.	Gurgaon – Kotputli	126.00	N.A.	9/1997	N.A.	March 01	Mar. 01	0	308.00	380.70	72.70
9.	Gondal –Ribda	17.00	13/3/2001	1/5/2001	0	April 03	Oct. 02	0	40.00	42.43	2.43
10.	Gowthami- Gundugolanu (AP 18)	84.50	14/3/2001	9/5/2001	0	Feb. 04	Feb. 04	0	277.00	339.70	62.70
11.	Hosur –Krishnagiri	45.40	20/1/2001	9/3/2001	0	June 04	Jan. 04	0	193.00	176.87	0.00
12.	Jaipur Bypass Phase –I	14.00	N.A.	N.A.	N.A.	Jan. 01	Jan. 01	0	61.00	83.76	22.76
13.	Jalandhar Bypass	14.40	15/21999	12/5/1999	-	Feb. 02	Jun.04	28	62.00	88.86	26.86
14.	Kishangarh- Nasirabad (KU I)	35.50	24/7/2001	21/8/2001	-	May 04	Jan. 04	0	110.00	141.03	31.03
15.	Lucknow – Kanpur Section (EW/2)	10.42	11/11/1999	8/2/2000	-	Oct. 01	Aug. 02	10	33.00	37.70	4.70
16.	Nasirabad -Gulabpura (KU	55.00	8/8/2001	5/9/2001	-	May 04	Jan. 04	0	151.00	172.23	21.23

	II)										
17.	Nagpur –Hyderabad	17.00	21/6/1999	8/7/1999	-	Dec. 01	April 02	4	40.00	38.53	0.00
18.	Palanpur- Dessa	22.70	15/3/2001	5/5/2001	-	Aug. 03	Feb. 03	0	53.00	57.79	4.79
19.	Raniganj- Panagarh	41.24	5/1/1996	6/3/1997	8	Nov. 01	Nov. 01	0	184.00	222.57	38.57
20.	Surat- Manor Project (Pck II)	38.60	11/10/1999	7/9/2000	5	April 03	Jan. 04	9	188.00	254.31	66.31
21.	Surat -Manor Project (Pck III)	57.40	11/10/1999	25/8/2000	4	Oct. 03	Nov. 03	1	196.00	286.31	90.31
22.	Udaipur Kesariaji (UG I)	62.00	18/6/2001	22/8/2001	-	April 04	Jan. 04	0	192.00	262.10	70.10
23.	Vijayawada-Chilkaluripet (Pck-I)	25.00	13/4/1998	6/11999	3	March 02	Jan. 03	10	73.00	77.65	4.65
24.	Vijayawada-Chilkaluripet (Pck-II) including Guntur By-pass	32.00	13/4/1998	6/1/1999	3	March 02	Jan., 03	10	72.00	70.61	0.00
25.	Vijayawada-Chilkaluripet (Pck-III) including Krishna Bridge approach	22.90	13/4/1998	6/1/1999	3	March 02	Jan. 03	10	67.00	67.37	0.37
26.	Vijayawada-Chilkaluripet (Pck IV) including Krishna bridge	2.88	14/4/1998	6/1/1999	3	May 02	May 02	0	64.00	69.45	5.45
27.	Westerly Diversion	34.25	23/9/1999	8/2/2000	-	August 02	Oct. 03	14	104.00	153.99	49.99
	Total	**956.68**						**0**	**3191.00**	**3864.63**	**692.62**

	B. Under Progress							@			
1	Champawati Vishakhapatnam (AP3)	46.20	12.02.01	29/3/2001	-	Feb. 04	*	8	169.00	171.95	*
2.	Chandikhole-Bhadrak	75.50	16.10.2000	23/11/2000	-	Dec. 03	*	10	324.00	278.51	*
3.	Gulabpura Bhilwara (KU III)	50.00	08.08.01	5/9/2001	-	May. 04	*	5	127.00	159.22	*
4.	Kolaghat – Kharagpur	64.00	17.10.2000	23/11/2000	-	Dec. 03	*	10	437.00	385.56	*

5.	Palasa Srikakulam (AP-2)	74.00	19.03.01	20/04/2001	-	Jan. 04	*	9	260.00	180.56	*
	Total	**309.70**			-				**1317.00**	**1175.80**	

- Not worked out because of works being under execution.

@ Delay worked out upto October 2004.

Annexure–IV
(Referred to in Para 2.4)

Loss of Toll Revenue

Sl. No.	Name of stretch	Period of delay	No. of days	Loss of toll revenue (Rs. in crore)	Audit Observation
(1)	(2)	(3)	(4)	(5)	(6)
1.	Barakar-Raniganj	Feb.,02 to June 02	122	4.05	Stretch completed in March 2001 but toll notification was obtained on 7 February 2002. This was due to delay in transfer of completed stretch from PWD West Bengal upto December 2001. Even after obtaining toll notification in February 2002, the collection of toll was delayed upto June 2002 due to non-finalisation of toll collection agency.
2.	Bhubaneshwar-Jagatpur	Jan., 02 to May 02	151	2.81	The Toll Notification was obtained on 27 December 2001. The toll collection started from 1 June 2002 after a delay of 5 months (151 days). The delay was attributed to law and order problem.
3	Vijayawada-Chilkaluripet	March 03 to May 03	83	4.62	Even though NHAI decided (September 2002) that toll notification and other preparatory work was to commence 120 days prior to the expected completion date, it initiated the process two months after completion resulting in delay.
4	Vijayawada-Eluru	July 02 to Feb.04	598	30.75	NHAI initially decided (June 01) to locate toll plaza at Km 13.200 of Eluru-By pass. Subsequently, decided (November 2002) to locate toll Plaza at km 26.8 and 53.3 of NH-5. This was once again changed (June 2003) to Km 31.8 and 53.3 Thus frequent change of decisions led to delay.
	Total			**42.23**	

Annexure–V

(Referred to in Para 2.5)

Sub-standard work or work not conforming to the specifications

Sl. No.	Name of the Stretch	Description of sub-standard work	Qty Executed	Value (Rs. in crore)	Audit observations	Reply of Ministry/NHAI	Remarks of Audit
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Gorhar–Barwa Adda	Inferior Geo-textile used / no Geo-textile used	11,91,656 sqm	5.79	The Geo-textile material used between Sub grade and Granular Sub-base in this project was not an approved material.	The work was to be approved after testing/ certification by IIT Delhi. IIT Delhi did not have the facility to do all testing. It was then left to the Engineer to decide.	Due to non-availability of testing facilities, NHAI failed to ascertain the suitability of the material used.
2.	Gurgaon-Kotputli	Additional layer of Distressed Bituminous Pavement		2.11	CRRI observed premature distress like deformation and cracking due to unstable mix, less voids in the mix and loose material in the sub-base. On being pointed out the same was rectified within the defect liability period at a cost of Rs.2.11 crore without any recovery from the contractor.	NHAI has disagreed with this payment and accordingly matter has since been referred to arbitrator. The award of the arbitrator was awaited.	Final recovery of the overpayment would be watched in audit.
3.	Hosur-Krishnagiri	Granular Sub Base with unconfirmed compressive strength	1,07,754 sqm	8.40	The cement treated sub-base should have compressive strength of 9 MPA/6MPA at 98 per cent maximum dry density as per technical specifications. But the PSC changed the specification to lower strength resulting in the work becoming sub-standard.	There was something inherently wrong with the specification provided in the contract. The strength specified was not achievable.	The reply that the applicable specifications are wrong is not acceptable. MOST specifications are based on empirical testing and the required strength was achievable. NHAI did not fix responsibility for the execution of this sub-standard work.

4.	Surat Manor-Pkg-1	Dense Bituminous Macadam (DBM)	89024 cum	19.03	According to MOST specifications, DBM should be provided with wearing course. But even after execution, the wearing course was not provided resulting in sub-standard execution of work.	The specifications are only suggestive. The contractor / Engineer are responsible for quality of work done.	The specifications form a part of the agreement and no deviation is permissible. Clause 507.5 requires wearing course as early as possible even if road has been opened to traffic. The liability of PSC/ Contractor to rectify did not permit relaxation of specifications. Further, the defect may not manifest during the Defect Liability Period, but the life of the road would be reduced.
5.	Surat-Manor Pkg-III	Pavement Quality Concrete on Toll Plaza		2.72	Agreement was to provide PQC with sensor paver. But the contractor did not use sensor paver.	Specifications also provide use of fixed form paver. During execution it was found to be difficult to use sensor paver.	The agreement provided the use of paver with sensor, which was not used. Hence quality/durability of work could not be ascertained.
6.	Surat-Manor Pkg-1	Well having shifts and tilts		1.95	The well should be constructed with a tolerable shift/tilt ranging from 50 to 300 mm only as against the executed shift/tilt ranging from 441 to 535 mm in three wells resulting in poor quality of work.	Agreed but the Engineer in his sole discretion, may consider accepting such a well, provided it is safe and rates are reduced.	There is no provision in the agreement for accepting sub-standard work at reduced rates.
		Total		**40.00**			

Annexure-VI
(Referred to in Para 3.1)

Variations in BOQ

Sl. No.	Name of the Stretch	Awarded Cost (Rs. in crore)	Cost of variations and excess over BOQ items (Rs. in crore)	Percentage of variation w.r.t. awarded cost. (4 To 3)
1	2	3	4	5
1.	Atul – Kajali	162.05	42.95	26.50
2.	Barwa-Adda-Barakar	133.00	30.14	22.66
3.	Gowthami-Gundugolanu	244.83	30.01	12.26
4.	Kajali-Manor	168.85	53.15	31.48
5.	Kishangarh-Nasirabad (KU-1)	95.90	11.80	12.30
6.	Raniganj-Panagarh	161.00	25.18	15.64
7.	Udaipur-Kesariaji	164.76	89.96	54.60
8.	Vijayawada-Eluru	147.20	127.80	86.82
9.	Westerly Diversion	92.06	33.26	36.13

* The above variations were based on the latest Interim Payment Certificates (periodic bills of the contractors) available and are likely to increase as the stretches get completed.

Annexure-VII
(Referred to in Para 3.1)

Item-wise variations in respect of two stretches noticed in PIU Gwalior

Stretch	BOQ item no.	Description	Quantity as per DPR (cum)*	Quantity as executed (cum)*	Excess quantity executed (cum)*	Variation (percentage)
NS-20	2.01(a)	Earthwork excavation	23,000	1,37,443	1,14,443	498
	2.01(d)	Excavation in marshy soil	1,000	3,425	2,425	243
	2.02 (a)	Excavation in all types of soil for widening	24,000	50,000	26,000	108
	2.03	Construction of embankment	2,73,000	2,28,000	(-) 45,000	(-) 16
	2.04	Construction of embankment with material obtained from roadway	24,000	43,969	19,969	83
	2.11	Earthwork excavation of unsuitable material	500	32,747	32,247	6,449
NS-21	2.02(a)	Excavation in all types of soil for widening	1,35,000	2,16,500	81,500	60
	2.03	Construction of embankment	4,50,000	-	-	-
	2.04	Construction of embankment with material obtained from roadway	100	1,08,250	1,08,150	1,08,150
	2.11	Earthwork excavation of unsuitable material	1,000	17,857	16,857	1,686

* cum denotes cubic meter

Annexure –VIII
(Referred to in Para 4)

Delay in award of work

Sl. No.	Sub-project	Target month of award	Month of actual award and commencement	Length (KM)	Delay (in months)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Agra-Sikandra	March 2001	March 2002	172	12
2.	Aurangabad-Barwa Adda	March 2001	March 2002	80	12
3.	Belgam Bypass	April 2001	June 2001	20	2
4.	Dankuni-Jharpokheria	September 2000	December 2000	118	3
5.	Etawa Bypass	March 2001	April 2001	14	1
6.	Haveri-Harihar	February 2001	March 2002	56	13
7.	Harihar-Tumkur	February 2001	March 2002	202	13
8.	Hosur-Krishnagiri	December 2000	June 2001	45	6
9.	Jaipur Bypass Ph-II	December 2000	December 2001	35	12
10.	Jaipur-Kishangarh	December 2000	April 2003	93	28
11.	Khaga-Varanasi	March 2001	September 2003	82	30
12.	Karnataka Border-Haveri	April 2001	June 2001	203	2
13.	Nellore Chennai	February 2001	June/August 20 01	154	4-6
14.	Nellore-Chilakaluripet	March 2001	May/August 2001	175	2-5
15.	Palsit-Dankuni	December 2000	October 2002	65	22
16.	Panagarh-Palsit	October 2000	June 2002	66	20
17.	Pune-Satara (5 stretches)	March 2001	July 2001 to November 2002	109	4-20
18.	Rajamundry-Eluru	March 2001	June/August 2001	120	3-5
19.	Satara-Maharashtra Border	September 2001	February 2002	133	5
20.	Sasaram Bypass	March 2001	March 2002	30	12
21.	Sikandra- Khaga	March 2001	March 2002	52	12
22.	Surat-Manor	April 2000	November 2000	176	7
23.	Tumkur Bypass	September 2001	December 2001	13	3
24.	Tumkur-Neelmangalam	February 2001	June 2002	32	16
25.	Tuni- Ankapalli	February 2001	May 2002	60	15
26.	Tuni-Rajamundry	March 2001	May 2002	50	14
27.	Udaipur-Gandhinagar (4 stretches)	March, 2001	October 2001 to June 2003	217	7-27
28.	Varanasi-Aurangabad	March 2001	March 2002	78	12
29.	Vishakhapatnam - Ichapuram	June 2001	June/September 2001	233	3
30.	Vivekananda Bridge	December 2000	September 2002	6	21
	Total			**2889**	

Annexure-IX

(Referred to in Para 4.2)

Standardisation of Stretches

Sl. No.	Name of stretch	Length km	Period of award	Estimated Cost (Rs. in crore)	Cost of award (Rs. in crore)	Cost per km (in crore)	Extra cost compared to. Lowest price (Rs. in crore)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Gulabpura-Bhilwara-KU-III	50.00	November 2001	164.25	104.90	2.10	-
2.	Kishangarh-Nasirabad-KU-I	36.23	November 2001	113.50	95.90	2.65	19.93
3.	Nasirabad-Gulabpura-KU-II	55.87	November 2001	182.09	131.75	2.36	14.53
4.	Surat-Atul (Surat-Manor –I)	79.60	November 2000	273.00	234.88	2.95	0.80
5.	Atul-Kajali Surat-Manor-II	38.60	November 2000	188.00	162.05	4.20	48.63
6.	Kajali-Manor Surat-Manor-III	57.40	November 2000	196.00	168.85	2.94	-
7.	Vijayawada-Chilkaluripet-I	25.00	March 1999	80.04	60.16	2.41	13.75
8.	Vijayawada-Chilkaluripet-II	32.00	March 1999	101.34	59.43	1.86	-
9.	Vijayawada-Chilkaluripet-III	22.89	March 1999	85.61	55.19	2.41	12.59
	Total	**397.59**					**110.23**

Annexure- X
(Referred to in Para 5.4)

Non-standardisation of Bill of quantities

	Bituminous courses and shoulders							
Sl.	**Name of Stretch/BOQ item**	**Length in km**	**Qty in cum as per BOQ**	**Qty/km**	**Rate per CUM**	**Extra qty per km w.r.t lowest**	**Extra Cost per km**	**Extra cost for the package**
1	**2**	**3**	**4**	**5=4/3**	**6**	**7**	**8=6 x 7**	**9=8 x 3**
	BOQ=4.01 (Technical specification Cl. 502)							**(Rs. in lakh)**
1	Agra - Dholpur (NS/5)	10	93,000	9,300.00	25.00	4,500.00	1,12,500.00	11.25
2	Agra - Gwalior (NS/4)	16	1,55,000	9,687.50	13.50	4,887.50	65,981.25	10.56
3	Agra - Gwalior (NS/6)	10	62,000	6,200.00	20.00	1,400.00	28,000.00	2.80
4	Chilkaluripet – Vijayawada Pkg – I	25	4,70,563	18,822.52	11.00	14,022.52	1,54,247.72	38.56
5	Chilkaluripet – Vijayawada Pkg – II	32	4,59,613	14,362.91	10.00	9,562.91	95,629.06	30.60
6	Chilkaluripet – Vijayawada Pkg – III	22.895	3,37,040	14,721.12	15.00	9,921.12	1,48,816.77	34.07
7	Delhi Border – Samalkha (NS/2)	15	72,000	**4,800.00**	14.00	0.00	0.00	0.00
8	Gondogolanu - Gowthami (AP-18)	84.5	10,74,152	12,711.86	10.80	7,911.86	85,448.07	72.20
9	Jagatpur – Chandikhole	33.2	5,81,676	17,520.36	17.00	12,720.36	2,16,246.14	71.79
10	Jalandhar Bypass (NS/1)	14.4	1,78,000	12,361.11	9.00	7,561.11	68,050.00	9.80
11	Lucknow- Kanpur (EW/2)	10.42	85,700	8,224.57	18.00	3,424.57	61,642.23	6.42
12	Nagpur – Hyderabad (NS/8)	17	1,55,000	9,117.65	17.00	4,317.65	73,400.00	12.48
13	Palanpur - Dessa (EW/11)	22.7	3,80,000	16,740.09	15.00	11,940.09	1,79,101.32	40.66
14	Raniganj – Panagarh	41.236	5,90,000	14,307.89	16.00	9,507.89	1,52,126.18	62.73
15	Vijayawada – Eluru	71.6	6,50,320	9,082.68	15.30	4,282.68	65,525.03	46.91
16	Vishakhapatnam - Champawati	46.2	7,85,166	16,994.94	17.00	12,194.94	2,07,313.90	95.78
	Total							546.61

	BOQ =4.02 (a) (Tech. specification 503)							
1	Agra - Dholpur (NS/5)	10	31,700	3,170.00	23.00	142.42	3,275.66	0.33
2	Agra - Gwalior (NS/4)	16	95,000	5,937.50	12.60	2,909.92	36,664.99	5.87
3	Agra - Gwalior (NS/6)	10	37,000	3,700.00	20.00	672.42	13,448.40	1.34
4	Barwa Adda – Barakar	42.69	2,38,000	5,575.08	16.00	2,547.50	40,759.94	17.40
5	Chilkaluripet - Vijayawada Pkg – I	25	2,19,548	8,781.92	5.00	5,754.34	28,771.70	7.19
6	Chilkaluripet - Vijayawada Pkg – II	32	11,26,080	35,190.00	4.00	32,162.42	1,28,649.68	41.17
7	Chilkaluripet - Vijayawada Pkg – III	22.895	213,380	9,319.94	15.50	6,292.36	97,531.56	22.33
8	Delhi Border - Samalkha(NS/2)	15	60,500	4,033.33	13.00	1,005.75	13,074.79	1.96
9	Gondogolanu - Gowthami (AP-18)	84.5	12,85,118	15,208.50	5.40	12,180.92	65,776.95	55.58
10	Hosur – Krishnagiri	45.4	1,75,000	3,854.63	20.00	827.05	16,540.91	7.51
11	Jagatpur – Chandikhole	33.2	1,45,419	4,380.09	17.00	1,352.51	22,992.68	7.63
12	Jalandhar Bypass(NS/1)	14.4	62,000	4,305.56	12.00	1,277.98	15,335.71	2.21
13	Lucknow- Kanpur(EW/2)	10.42	39,400	3,781.19	18.00	753.61	13,564.98	1.41
14	Nagpur - Hyderabad (NS/8)	17	92,000	5,411.76	21.00	2,384.18	50,067.88	8.51
15	Palanpur - Dessa(EW/11)	22.7	3,80,000	16,740.09	6.00	13,712.51	82,275.05	18.68
16	Raniganj – Panagarh	41.236	2,21,000	5,359.39	15.00	2,331.81	34,977.22	14.42
17	Surat - Manor Pkg – 3	57.4	4,19,000	7,299.65	20.23	4,272.07	86,402.65	49.60
18	Vijayawada – Eluru	71.6	2,16,775	**3,027.58**	14.40	0.00	0.00	0.00
19	Vishakhapatnam - Champawati(AP-3)	46.2	7,85,166	16,994.94	7.00	13,967.36	97,771.49	45.17
20	Westerly Diversion	34.25	1,70,000	4,963.50	17.81	1,935.92	34,478.80	11.81
	Total							**320.12**

	BOQ=4.02 (b) (Technical spen. 503)							
1	Agra - Dholpur (NS/5)	10	52,100	5,210.00	23.00	1,380.83	31,759.09	3.18
2	Agra - Gwalior (NS/4)	16	1,73,000	10,812.5	12.60	6,983.33	87,989.96	14.08

				0				
3	Agra - Gwalior (NS/6)	10	52,000	5,200.00	20.00	1,370.83	27,416.60	2.74
4	Barwa Adda – Barakar	42.69	5,26,000	12,321.39	16.00	8,492.22	1,35,875.47	58.01
5	Chilkaluripet - Vijayawada Pkg – I	25	1,29,021	5,160.84	4.50	1,331.67	5,992.52	1.50
6	Chilkaluripet - Vijayawada Pkg – II	32	1,48,284	4,633.88	4.50	804.71	3,621.17	1.16
7	Chilkaluripet - Vijayawada Pkg – III	22.895	2,15,980	9,433.50	18.00	5,604.33	1,00,877.95	23.10
8	Delhi Border – Samalkha (NS/2)	15	81,000	5,400.00	13.00	1,570.83	20,420.79	3.06
10	Gondogolanu - Gowthami (AP-18)	84.5	26,91,382	31,850.67	4.50	28,021.50	1,26,096.77	106.55
11	Hosur – Krishnagiri	45.4	3,45,000	7,599.12	18.00	3,769.95	67,859.08	30.81
12	Jagatpur – Chandikhole	33.2	2,48,075	7,472.14	17.00	3,642.97	61,930.47	20.56
13	Jalandhar Bypass (NS/1)	14.4	76,000	5,277.78	12.00	1,448.61	17,383.29	2.50
14	Lucknow- Kanpur (EW/2)	10.42	39,900	3,829.17	18.00	0.00	0.00	0.00
15	Nagpur - Hyderabad (NS/8)	17	1,01,000	5,941.18	19.00	2,112.01	40,128.12	6.82
16	Palanpur- Dessa (EW/11)	22.7	12,00,000	52,863.44	4.00	49,034.27	1,96,137.06	44.52
17	Raniganj – Panagarh	41.236	3,51,000	8,511.98	15.00	4,682.81	70,242.15	28.97
18	Surat - Manor Pkg – 3	57.4	4,19,000	7,299.65	20.23	3,470.48	70,190.49	40.29
19	Vijayawada – Eluru	71.6	6,31,842	8,824.61	15.30	4,995.44	76,430.22	54.72
20	Vishakhapatnam - Champawati (AP-3)	46.2	16,72,310	36,197.19	5.00	32,368.02	1,61,840.08	74.77
21	Westerly Diversion	34.25	1,40,000	4,087.59	17.81	258.42	4,602.48	1.58
	Total							**518.92**

	BOQ=4.03 (Technical spn. 501 & 507)							
1	Agra - Dholpur (NS/5)	10	1,000	100.00	2,300.00	0.00	0.00	0.00
2	Agra - Gwalior (NS/4)	16	3,300	206.25	2,214.00	106.25	2,35,237.50	37.64

3	Agra - Gwalior (NS/6)	10	3,200	320.00	2,100.00	220.00	4,62,000.00	46.20
4	Barwa Adda – Barakar	42.69	11,778	275.90	2,800.00	175.90	4,92,508.78	210.25
8	Delhi Border - Samalkha (NS/2)	15	14,100	940.00	2,200.00	840.00	18,48,000.00	277.20
9	Gondogolanu - Gowthami (AP-18)	84.5	13,851	163.92	2,583.00	63.92	1,65,098.02	139.51
10	Jalandhar Bypass(NS/1)	14.4	1,500	104.17	1,662.00	4.17	6,925.00	1.00
11	Lucknow- Kanpur(EW/2)	10.42	5,200	499.04	2,800.00	399.04	11,17,312.86	116.42
12	Raniganj – Panagarh	41.236	14,261	345.84	2,800.00	245.84	6,88,348.05	283.85
16	Vijayawada – Eluru	71.6	19,974	278.97	2,250.00	178.97	4,02,674.58	288.32
18	Vishakhapatnam - Champawati (AP-3)	46.2	13,849	299.76	3,755.00	199.76	7,50,105.95	346.55
	Total							1746.94

	BOQ=4.04 (Technical Spem. 507)							
1	Agra - Dholpur (NS/5)	10	29,000	2,900.00	2,300.00	1,570.68	36,12,564.00	361.26
2	Agra - Gwalior (NS/4)	16	46,000	2,875.00	2,214.00	1,545.68	34,22,135.52	547.54
3	Agra - Gwalior (NS/6)	10	28,400	2,840.00	2,100.00	1,510.68	31,72,428.00	317.24
4	Barwa Adda – Barakar	42.69	1,05,693	2,475.83	2,800.00	1,146.51	32,10,216.02	1370.44
5	Chilkaluripet - Vijayawada Pkg – I	25	59,215	2,368.60	1,975.00	1,039.28	20,52,578.00	513.14
6	Chilkaluripet - Vijayawada Pkg – II	32	75,410	2,356.56	1,975.00	1,027.24	20,28,803.94	649.22
7	Chilkaluripet - Vijayawada Pkg – III	22.895	54,990	2,401.83	2,297.00	1,072.51	24,63,565.72	564.03
8	Delhi Border - Samalkha(NS/2)	15	53,500	3,566.67	2,200.00	2,237.35	49,22,162.67	738.32
10	Gondogolanu - Gowthami (AP-18)	84.5	2,25,592	2,669.73	2,583.00	1,340.41	34,62,273.37	2925.62
12	Hosur – Krishnagiri	45.4	1,51,100	3,328.19	2,150.00	1,998.87	42,97,578.74	1951.10
14	Jagatpur – Chandikhole	33.2	77,460	2,333.13	2,675.00	1,003.81	26,85,198.52	891.49
15	Jalandhar Bypass(NS/1)	14.4	41,300	2,868.06	1,662.00	1,538.74	25,57,378.49	368.26
16	Lucknow- Kanpur(EW/2)	10.42	31,000	2,975.05	2,400.00	1,645.73	39,49,747.16	411.56
17	Nagpur - Hyderabad (NS/8)	17	49,500	2,911.76	2,084.00	1,582.44	32,97,814.77	560.63
18	Palanpur - Dessa(EW/11)	22.7	42,000	1,850.22	2,300.00	520.90	11,98,070.61	271.96
19	Raniganj – Panagarh	41.236	1,02,900	2,495.39	2,800.00	1,166.07	32,65,002.65	1346.35

20	Surat - Manor Pkg – 3	57.4	1,61,333	2,810.68	2,324.00	1,481.36	34,42,679.34	1976.10
21	Vijayawada – Eluru	72	95,711	**1,329.32**	2,205.00	0.00	0.00	0.00
22	Vishakhapatnam - Champawati(AP-3)	46.2	92,443	2,000.93	3,864.00	671.61	25,95,103.88	1198.94
23	Westerly Diversion	34.25	89,165	2,603.36	1,947.00	1,274.04	24,80,551.33	849.59
	Total							**17812.79**

	BOQ=4,05 (a) (Technical spen. 512)							
1	Agra - Dholpur (NS/5)	10	9,000	900.00	2,300.00	415.42	9,55,466.00	95.55
2	Agra - Gwalior (NS/4)	16	14,500	906.25	2,457.00	421.67	10,36,043.19	165.76
3	Agra - Gwalior (NS/6)	10	8,900	890.00	2,100.00	405.42	8,51,382.00	85.13
4	Barwa Adda – Barakar	42.69	32,131	752.66	3,100.00	268.08	8,31,043.98	354.77
5	Chilkaluripet - Vijayawada Pkg – I	25	18,575	743.00	2,200.00	258.42	5,68,524.00	142.13
6	Chilkaluripet - Vijayawada Pkg – II	32	26,670	833.44	2,200.00	348.86	7,67,486.50	245.60
7	Chilkaluripet - Vijayawada Pkg – III	22.895	15,900	694.47	2,497.00	209.89	5,24,107.26	119.99
8	Delhi Border - Samalkha(NS/2)	15	18,000	1,200.00	2,303.00	715.42	16,47,612.26	247.14
9	Gondogolanu - Gowthami (AP-18)	84.5	59,107	699.49	2,790.00	214.91	5,99,602.04	506.66
10	Hosur – Krishnagiri	45.4	42,500	936.12	2,873.00	451.54	12,97,284.04	588.97
11	Jagatpur – Chandikhole	33.2	25,230	759.94	2,786.00	275.36	7,67,152.29	254.69
12	Jalandhar Bypass(NS/1)	14.4	12,800	888.89	1,777.00	404.31	7,18,456.90	103.46
13	Lucknow- Kanpur(EW/2)	10.42	9,700	930.90	2,700.00	446.32	12,05,069.70	125.57
14	Nagpur - Hyderabad (NS/8)	17	15,500	911.76	2,280.00	427.18	9,73,981.13	165.58
15	Palanpur - Dessa(EW/11)	22.7	11,000	**484.58**	2,700.00	0.00	0.00	0.00
16	Raniganj – Panagarh	41.236	31,600	766.32	2,950.00	281.74	8,31,135.04	342.73
17	Surat - Manor Pkg – 3	57.4	50,130	873.34	2,478.00	388.76	9,63,359.54	552.97
18	Vijayawada – Eluru	71.6	41,221	575.71	2,439.00	91.13	2,22,271.66	159.15
19	Vishakhapatnam- Champawati (AP-3)	46.2	35,191	761.71	4,032.00	277.13	11,17,387.99	516.23

20	Westerly Diversion	34.25	31,550	921.17	2,548.00	436.59	11,12,425.93	381.01
	Total							**5,153.09**
	Grand Total							**26,098.47**
								Rounded to Rs.260.98 crore

Annexure – XI
(Referred to in Para 7.2.2)

Non-Levy of Liquidated Damages

Sl. No.	Name of Stretch	Stipulated time for completion	Delay	LD not levied. (Rs. in crore)	Audit analysis	Ministry's reply	Further remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Barwa-Adda-Barakar Sec.A	24 months	630 days	13.39	Section 'A' of the contract package was scheduled to be completed in April 1999 but was completed only in December 2001. The PSC recommended (May 2001) EOT for Section 'A' up to the end of March 2000. But NHAI did not levy LD for the non-regulated period of 630 days in respect of Section 'A' even after three years of completion of the stretch (December 2004).	Ministry stated (April 2005) that the matter was under arbitration.	
2	Gurgaon-Kotputli Sec. A	18 months	107 days	3.32	The due date for completion of Section 'A' as per contract was 2 November 1999. As against this, the Section was completed on 28 September 2000, after a delay of 391 days. NHAI had allowed extension of time only for 284 days. LD was required to be levied for non-regulated period of 107 days.	Ministry stated (April 2005) that the project was completed before the extended period i.e. upto 1st May 2001 and hence no LD was levied.	The reply was not acceptable, as the PSC, after analysing the reasons for delay, had recommended EOT for 284 days only. But NHAI had subsequently withdrawn the due dates for sectional completion relaxing the

							contract provisions and against the recommendations of the PSC, which was unwarranted.
3.	OR-Package II Sec. A Sec.B	 24 months 27 months	 47 days	 2.82	The completion time for four laning of Section 'A' of this package was 18 December 2002 for 22 km. But the contractor completed only two lanes upto DBM level within the scheduled date. But NHAI accepted this stretch as completed within time as the contractor completed more than the equivalent length (50.5 km) upto DBM level for two lanes in other sections of the packages. NHAI further allowed (December 2003) 226 days of EOT for land constraint, adverse climatic conditions, additional earthwork etc. But contract provided for allowing EOT only for "exceptionally adverse climatic conditions".	Ministry stated (April 2005) that delays were due to delay in handing over site, execution of additional works etc. which were beyond the control of the contractor.	The reply is untenable because the decision of NHAI to declare the stretch as complete especially when it was completed upto DBM level and for only two lanes was against contract provisions and awarding EOT for adverse climatic conditions during summer/monsoon season was unwarranted.
4.	Raniganj-Panagarh Sec.A Sec.B Sec.C	 30 months 39 months 42 months	 298 days 444 days Nil	15.76	The work commenced in July 1997 and was scheduled to be completed in January 2000 (for Section A), October 2000 (for Section B) and January 2001 (for Section C). But all the sections were completed in December 2001 involving a delay of 10	Ministry stated (April 2005) that the matter had been referred to the arbitration.	

					months for Section A and 15 months for Section B. The EOT was recommended by PSC only for Section A upto February 2000 and for Section C upto February 2002. Therefore, LD had to be levied for the period beyond the recommended period. But NHAI had not finalised LD even after a lapse of three years (upto December 2004) after completion of the project.		
5	Surat-Manor Pkg-II	General Extension upto February 2004	273 days	16.20	The work was scheduled to be completed on 30 April 2003. But NHAI allowed provisional EOT upto 7 February 2004. Audit noticed that delay was attributable to inadequate contribution of the lead partner, problems created by contractors' workers etc. for which no EOT was justifiable.	Ministry stated (April 2005) that progress was behind the schedule due to inadequate contribution of the lead partner and therefore, the entire work was handed over to the other Joint Venture partner. Also additional work was awarded to the contractor which involved delay.	The reply is not acceptable because there was no provision for grant of EOT for the internal problems of the contracting firms. PSC recommended EOT for 20 days only for additional work whereas NHAI allowed EOT for 9 months which was unwarranted.
	Total			**51.49**			

Annexure –XII
(Referred to in Para 8.1)

Inadmissible payment of price variation

Sl. No.	Name of Stretch	Amount (Rs. in crore)	Reasons for inadmissibility	Reply of Ministry/NHAI	Remarks of Audit
(1)	(2)	(3)	(4)	(5)	(6)
1	Chilkaluripet-Vijayawada packages I to III	2.96	The agreed base rate at Rs. 9,000 per metric tone (MT) of bulk bitumen grade 60/70 had been unauthorisedly changed as Rs.8,000 per MT which resulted in overpayment.	The correction (overwriting as Rs.8000/- in place of Rs.9000/-) was found in all the available bids (of bidders L1, L2 & L3). However, the same was not attested by the officials signing the agreement resulting in objection of Audit. The prevailing rate of 60/70 bitumen was even less than Rs.8000/-Hence the correction seems to be reasonable.	The base rate for 60/70-grade bulk bitumen was to be taken as that prevailing 28 days prior to the last date of submission of bid. This rate was Rs.9217.94 as on 1.2.1998. This fact is corroborated by the original rate of Rs. 9000 contained in the bid documents. This was unauthorisedly overwritten in the bid as Rs. 8000 that led to the overpayment.
2.	Eluru-Vijayawada	4.04	Price variation on US dollars was paid when the tender was evaluated for Indian Currency.	The payment is as per the contract.	The reply is not acceptable in view of the audit observation.
3.	Gurgaon-Kotputli	1.75	Price escalations were paid on provisional sums, which were not payable as per the agreement conditions.	The matter is under arbitration.	
		2.73	Payment for exchange variation in US dollars was not admissible when price variations on foreign inputs paid separately.	The matter is under arbitration.	
4.	Surat-Manor Pkg-II	1.01	Agreement with the contractor provided for paying price escalation for the foreign input at 13.98 per	NHAI replied that foreign input component of 13.98 per cent was based on contractual provisions and based on	The reply is not acceptable in view of the fact that the lead partners of the project had

			cent. Despite the fact that the change in composition of key person resulted in reduction of foreign input to 11.52 per cent, the price escalation was not proportionately reduced which resulted in overpayment.	the input details made available before signing the agreement.	already withdrawn and the works were completed only by the local partners and on this ground, NHAI already allowed EOT to the local partners.
5.	Westerly Diversion	0.74	As per the contract provisions, the value of work done during the month should include value of materials on which material advance was received during the month and exclude the value of materials on which material advance was recovered during the month. But the value of materials on which the advance paid/recovered was not included resulting in excess payment of price variation.	The Ministry endorsed (April 2005) the views of the Management, which stated that secured advances have not been included in the cost of work done as per sub clause 70 of the contract.	As per the general conditions of the contract, the value of work done during the month should take into account the value of materials on which secured advance was paid/recovered. But this condition was not followed for this stretch resulting in overpayment.
	Total	**13.23**			

Annexure-XIII
(Referred to in Para No.8.2)

Excess Paid over Reasonable rates for provisional items

Sl. No.	Name of the Package	Description of work	Qty executed	Rates paid as Per BOQ (Rupees)	Reasonable rates @ (Rupees)	Differential rate (Rupees)	Excess Payment (Rs. in crore)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Barwa-Adda-Barakar	Removal and disposal of unsuitable soil	251640.50 cum 49501.00 cum	53.70 per cum 89.50 per cum	40.28 20.10	13.42 69.40	0.68
2.	Gurgaon-Kotputli	Removal of Stumps	14305 Nos.	N.A.	NIL*	N.A.	1.18
3.	Raniganj-Panagarh	Removal and disposal of unsuitable soil	180921 cum 44305 cum	150 per cum. 50 per cum	40.00 22.50	110.00 27.50	2.11
4.	Surat-Manor-I	Removal of Stumps	24870 Nos.	615 to 1845 per No.	NIL*	615 to 1845	2.91
5.	Surat-Manor-II	Removal of Stumps	5879 Nos.	786 to 4718 per No.	NIL*	786 to 4718	1.56
6.	Westerly Diversion	Removal of unsuitable material transportation upto 1km	68025 cum	Rs.173 per cum	NIL*	173	1.18
7.	Westerly Division	Filling of Potholes with DBM Mix	20,996 sqm	690/sqm	148.45/ sqm	541.55	1.14
	Total						10.76

@ *Reasonable rates as worked out by NHAI/PSCs*
* *No payment admissible in terms of the contract.*

GLOSSARY OF ABBREVIATIONS

Sl.No.	Abbreviation	Full form
1.	AP	Andhra Pradesh
2.	BC	Bituminous Concrete
3.	BG	Bank Guarantee
4.	BM	Bituminous Macadam
5.	BOQ	Bill of Quantities
6.	BOT	Built, Operate and Transfer
7.	Cum	Cubic Meter
8.	COPA	Condition of Particular application
9.	CRF	Central Road Fund
10.	CPWD	Central Public Works Department
11.	CRRI	Central Road Research Institute
12.	CSUS	Cement Stabilized Upper Sub base
13.	CTUS	Cement Treated Upper Sub-base
14.	CWIP	Capital Work-in-Progress
15.	DBM	Dense Bituminous Macadam
16.	DPR	Detailed Project Report
17.	EDMS	Electronic Drawing Management System
18.	EOT	Extension of Time
19.	EPC	Engineering, Procurement and Construction
20.	EW	East-West
21.	FIDIC	International Federation of Consulting Engineers
22.	GIS	Geographical Information Systems
23.	GQ	Golden Quadrilateral
24.	GSB	Granular Sub Base
25.	HRD	Human Resources Development
26.	HRMS	Human Resource and Inventory Management Systems
27.	IRC	Indian Road Congress
28.	JBIC	Japan Bank of International Cooperation
29.	LD	Liquidated Damages
30.	MoSRTH	Ministry of Shipping, Road Transport and Highways
31.	MOST	Ministry of Surface Transport (formerly)
32.	MP	Madhya Pradesh
33.	MT	Metric Ton
34.	NH	National Highway
35.	NHDP	National Highway Development Project
36.	NS	North South
37.	NSEW	North-South-East-West
38.	PCC	Profile Corrective Course
39.	PD	Project Director

40.	PFMS	Project Financial Management System
41.	PIB	Public Investment Board
42.	PIU	Project Implementation Unit
43.	PLI	Professional Liability Insurance
44.	PSC	Project Supervision Consultant (Engineer)
45.	PWD	Public Works Department
46.	RCC	Reinforced cement concrete
47.	SPV	Special Purpose Vehicle
48.	TOR	Terms of Reference
49.	UP	Uttar Pradesh
50.	WB	West-Bengal
51.	WMM	Wet Mix Macadam

GLOSSARY OF TECHNICAL TERMS

Sl. No.	Items of work	Description
(1)	(2)	(3)
1.	Alignment	The vertical and horizontal location of a road.
2.	Bitumen	A viscous liquid or solid material black or dark brown in colour, having adhesive properties, consisting essentially of hydrocarbons, derived from petroleum occurring in natural asphalt and soluble in carbon disulphide. Normal grades used - 50 pen (hard) to 100 pen (soft).
3.	Bituminous	Containing Bitumen
4.	Bituminous Concrete (BC)	Laying and compacting for use in wearing or PCC in the thickness of 25 mm to 100 mm, using prescribed aggregate and premixed with bitumen on a bituminous bound surface.
5.	Borrow Excavation	When NHAI specifies a new roadway to be constructed; the roadway embankment is usually constructed from earth available on the right-of-way, however, if there is insufficient earth the contractor is required to obtain the needed additional material from off the right-of-way *(land)*. This material is called borrow excavation
6.	Borrow Pit	The source of approved material required for the construction of embankments, or other portions of earthwork requirements.
7.	Cement Treated Upper Sub-base	The portion of sub base treated with cement so as to provide improved strength.
8.	Contract Specifications	The requirements, which are to be followed in the construction of highways.
9.	Culvert	Any structure, not classified as a bridge, which provides an opening under the roadway.
10.	Day Work	An item in BOQ for which rates for the supply of labour, material and plant & machinery are quoted by the bidder. If PSC considers necessary the varied work is executed on Day Work basis.
11.	Dense Bituminous Macadam (DBM)	A dense bitumen macadam road base or base course manufactured with bitumen.
12.	Design Life	Initially figured to be a 20-year period for pavement.
13.	Earth Excavation	On a construction project that requires new or relocated roadway, the earth, which must be moved from one place to another, is called earth

		excavation.
14.	Earthen Embankment	Earthen embankment including Subgrade, earthen shoulders and miscellaneous backfill with approved material obtained from roadway excavation, borrow pit or other sources.
15.	Environmental Impact	The effects a project will have upon the environment, especially the human environment.
16.	Excavation	The act of taking out materials, the materials taken out, or the cavity remaining after materials have been removed. NHAI has an agreement with the
17.	Expressway	A divided arterial highway for through traffic with full or partial control of access and generally with grade separations at major intersections.
18.	Fly Ash	The finely divided residue that results from the combustion of ground or powdered coal, transported from the firebox through the boiler by flue gases.
19.	Geo-textile Material	Woven cloth made from nylon type of material that is not bio-degradable
20.	Granular Sub-base	A continuously graded granular material to MOST Specification for Highway Works. Used in the sub-base layer of road construction, which consists of crushed rock, slag or concrete is the superior material and is the only one permitted for major trunk roads and motorways.
21.	Mobilization Advance	The employer typically reimburses the contractor when completed portions of work are performed. Contractors therefore must find financing to help start a new project. The pay item mobilization is provided to help the contractor with these early start-up costs.
22.	Professional Liability Insurance	Professional Liability Insurance is an insurance to cover a loss resulting from malpractice or other liability of a professional person to a third party. The insured's benefits under the policy begin when the insured's liability to a third party has been asserted.
23.	Pavement	The part of a roadway having a constructed surface for the facilitation of vehicular movement.
24.	Permanent Work	The items of work in the BOQ to be executed in accordance with the contract.
25.	Profile Correction Course	A bituminous or non bituminous course provided to rectify the undulations and camber correction of road surface
26.	Rigid pavement	Road pavement / surface constructed with cement concrete

27.	River Shingles	Small size stones available in river bed.
28.	Specifications	The standard specifications, supplemental specifications, special provisions, and all written or printed agreements and instructions pertaining to the method and manner of performing the work or to the quantities and qualities of the materials to be furnished under the contract.
29.	SPV	A special company established by a company to meet a specific financial objective.
30.	Terrain	The physical features of a tract of land.
31.	Variation item	This include increase or decrease in quantity, additional or omitted item, change in character or quality, levels, lines, positions and specified sequence
32.	Wearing course	The top surface of a road, which is made of asphalt and laid over the base course. It is made using high quality stone to improve wear and skid resistance.
33.	Weep Holes	Small openings whose purpose is to permit drainage of water that accumulates inside a building component (e.g., a wall etc.)
34.	Wet Mix Macadam (WMM)	Laying and compacting coarse and fine crushed rock or slag blended to meet the grading requirement. Clean crushed graded aggregate and granular material premixed with water to a dense mass on a prepared sub base
35.	Voids	Space occupied by air particles during compaction of any pit.