

CHAPTER IV

WORKS EXPENDITURE

SECTION – A
AUDIT REVIEW

4.1 Integrated Audit and Manpower Management Audit of Water Resources Organisation (Public Works Department)

Summary Highlights

The Department failed to utilise the available water resources effectively. While there was a large gap between the irrigation potential created and utilised in respect of surface water, there was overexploitation of ground water potential due to taking up of unviable projects, defective scheme formulation, poor execution and improper maintenance of projects. There was avoidable time and cost overrun in execution of projects and extra expenditure incurred by not following Indian Standard Specifications. The control over expenditure is lacking and there was no norm prescribed for employing manpower.

The following are some of the important points noticed in Audit:

- Issue of Letter of Credit for more than the required amount and diversion of unutilised Letter of Credit resulted in expenditure in excess of the approved grant.

(Paragraph 4.1.4.2)

- Only four per cent of irrigation potential created under 10 projects was actually utilised. While inefficient scheme formulation resulted in non-creation of irrigation potential envisaged, poor execution and improper maintenance contributed to non-utilisation of potential created. While water was not utilised for irrigation in two projects, the irrigation efficiency was only 22 per cent in 8 projects.

(Paragraph 4.1.6)

- There was cost overrun of Rs 169.61 crore in respect of eight projects due to delay in acquisition of land and delay in finalisation of design. There was also time overrun of 3 to 15 years in four cases.

(Paragraph 4.1.7.5)

- Non-preparation of estimate based on the outturn achieved in using Government machines resulted in extra liability of Rs 23.09 crore in the work of desilting rivers, drains and channels in Cauvery delta. There was poor planning and desilting was executed in reaches where permission was sought for leasing sand quarries by District Collectors.

(Paragraph 4.1.7.6.3 (ii) (f))

- **There was extra expenditure of Rs 6.34 crore in executing schemes under Tamil Nadu Water Resources Consolidation Project due to not following the Indian Standard Specifications, additional payments made for works already included in contracts, poor investigation, change of design and delay in finalising tenders. Inadmissible payment of secured advance resulted in unintended benefit of Rs 1.02 crore to 21 contractors.**

(Paragraph 4.1.7.6.4 (i))

- **Manpower was not employed based on workload; test-check revealed employment of excess manpower resulting in unfruitful expenditure of Rs 19.87 crore.**

(Paragraph 4.1.8 (i))

4.1.1 Introduction

As of June 2000, Tamil Nadu has 84.03 lakh hectares (ha) of cultivable land and 45.88 lakh ha of uncultivable land. Of the cultivable land, 54.64 lakh ha (65 *per cent*) were actually under cultivation. In view of the increasing demand for water, Government of Tamil Nadu formulated Tamil Nadu Water Policy in July 1994 prioritising usage of water in the order of Drinking, Irrigation, Hydropower, Industry and other uses. The broad objectives of the water policy with reference to irrigation is to establish a management information system for water resources, ensure preservation and stabilisation of existing water resources, plan for augmentation of utilisable water resources, promote research and training for water management, and promote user participation in water planning/ management. The policy recognised river basins as the unit for water resources planning and planned to supplement the deficit basins with water from surplus basins.

With a view to water planning on river basin basis, the Government re-organised the Public Works Department (PWD) into two wings viz., Water Resources Organisation (WRO) and Building Organisation from December 1995. The objective of WRO is to ensure effective management and distribution of surface and ground water for its optimum utilisation in a rational and scientific manner to maximise agricultural production and the productivity of all the water using sectors. The progress made in increasing the irrigation potential vis-à-vis the land brought under irrigation during the successive Five Year Plans are furnished in Appendix XXV. It could be seen therefrom that the area irrigated by canal and tank systems was much less than the potential created whereas the exploitation of ground water for irrigation had increased manifold. The non-exploitation of irrigation potential created under canal and tank systems was mainly due to defects in project formulation and poor maintenance as discussed in Paragraphs 5 and 6.

The Ninth Plan envisaged that there was no scope for major and medium irrigation projects and felt the need for water conservation, modernisation of canal and tank systems, water management of the existing sources and exploitation of minor irrigation. The major

projects/schemes implemented from 1997-98 to 2000-2001 and their objectives are furnished in Appendix XXVI.

4.1.2 Organisational set up

The WRO is headed by the Engineer-in-Chief, Chennai (EIC) who is responsible for policy making, administration of WRO, implementing and monitoring of programmes, budget control and manpower. He is assisted by 10 Chief Engineers (CEs), 6 in charge of Plan Formulation, Design, Research and Construction Support (DRCS), Operation and Maintenance (O&M), Ground Water, Water Studies and Training and 4 in charge of four regions - Chennai, Pollachi, Thiruchirapalli and Madurai. Under these CEs, there are 29 circles each headed by a Superintending Engineer (SE) for supervising the functioning of 107 divisions each headed by an Executive Engineer (EE). The overall administrative control rests with Secretary, PWD.

4.1.3 Audit coverage

The records of the PWD at Secretariat, offices of the EIC and 8 CEs, 11 Circles, 38 Divisions, 16 Taluk Offices, three Revenue Divisional Offices and three District Collectorates for the period from 1997-2001 were test-checked during November 2000 to April 2001. The significant points noticed on management of Finance, Programme and Manpower are discussed in the succeeding paragraphs.

4.1.4 Financial Management

The total provision of funds by Legislature under Revenue and Capital Grants (excluding Flood Control Programmes), Final Modified Appropriation (FMA) after surrender and the actual expenditure incurred during 1997-2001 are as under:

(Rupees in crore)

Year	Total Provision	FMA	Actual expenditure	Excess (+)/ Savings (-)
(1)	(2)	(3)	(4)	Column (4)-(2)
Revenue				
1997-98	284.94	278.32	409.43	(+) 124.49
1998-99	366.85	363.75	379.05	(+) 12.20
1999-2000	315.44	221.85	413.27	(+) 97.83
2000-2001	365.78	365.78	479.38	(+) 113.60
Capital				
1997-98	250.96	93.47	78.99	(-) 171.97
1998-99	277.94	246.32	226.45	(-) 51.49
1999-2000	483.51	483.51	360.57	(-) 122.94
2000-2001	469.82	360.02	290.39	(-) 179.43

The excess under Revenue was mainly due to booking of pro-rata charges on establishment, interest, pension, etc., under various schemes for which there was no/less provision in the budget. Excluding the excess expenditure on this account, there was savings in all the years as under:

(Rupees in crore)

Year	Excess as per accounts	Excess on account of pro-rata charges	Net Savings in the grant
1997-98	124.49	131.21	(-) 6.72
1998-99	12.20	19.21	(-) 7.01
1999-2000	97.83	197.21	(-) 99.38
2000-2001	113.60	124.61	(-) 11.01

The question of booking pro-rata charges was under correspondence between the Government and Accountant General - Accounts and Entitlements (AG (A&E)).

The savings under Capital were mainly on account of non-utilisation of funds provided under Water Resources Consolidation Project (WRCP) due to revision of estimates as per World Bank norms and consequent delay in finalisation of tenders, non-purchase of equipment for operation and maintenance under WRCP due to rejection of tenders by Contract Award Committee and less expenditure on percentage charges for establishment transferred from Revenue Account.

4.1.4.1 Budgetary Management and Control

(i) Though the work of desilting of rivers, canals, etc., was in the nature of maintenance and the expenditure thereon was treated as revenue expenditure during 1997-98 and 1998-99, the budget provisions for 1999-2000 and 2000-2001 were wrongly made under Capital and Rs 94.05 crore was incurred during 1999-2001.

(ii) Contrary to Manual provisions, the Department generally obtained budget provision under establishment for vacant posts also resulting in savings.

(iii) Though Codal provisions stipulated that liabilities should not be created without assurance for provision of funds, the EE of eleven divisions created a liability of Rs 22.80 crore as of March 2001 towards payment due to contractors and others. It was seen that the liabilities from the year 1995 onwards were not settled eventhough there was huge savings and surrender under 'Capital' grant during 1997-2001. In respect of desilting works undertaken in Cauvery Delta, the CE, Thiruchirapalli requested for a provision of Rs 2.75 crore during 1998-99 against a liability of Rs 4.94 crore. Government, however, provided only Rs 2.14 crore in 1998-99.

(iv) In January 1994, Government abolished the system of Cash Settlement Suspense Account to account for inter-divisional transactions. Test-check revealed that Rs 11.68 crore out of Rs 11.73 crore outstanding in 9 Irrigation Divisions and Public Works (PW) Workshop as of March 2000 had not been cleared as of December 2000 for want of provision of funds. The non-clearance of the balance

Liabilities not settled eventhough funds were available.

Inter-division adjustments not made for want of funds.

under this suspense head resulted in non-booking of expenditure under the relevant final head of account.

(v) In respect of five schemes, involving land acquisition for commencement of work, huge provisions were given in the budget resulting in surrender at the end of the year as indicated in Appendix XXVII.

4.1.4.2 Control of expenditure

The departmental officers were authorised to make payment by cheques and appropriation control is effected through Letter of Credit (LOC) system. After the Appropriation Act is passed, the EIC submits a statement to Finance Department stating the amount required for operation at Headquarters for adjustments and allocation to subordinate officers. Based on this statement, the Finance Department issues a LOC for each Major Head to the Treasury Officer, who in turn intimates the same to the branches of State Bank of India. Finance Department also issues quarterly LOC for establishment, works expenditure and maintenance separately to the EIC who in turn re-allocates them to the subordinate officers based on the Budget allocation. Thus, the Divisional Officers are to restrict issue of cheques only to the amount authorised to them through LOC and Budget allocation for each unit of appropriation. In May 1998, the Finance Department authorised the Regional CEs to send the requisition for LOC based on the Budget allocation made by EIC to avoid delay and issued LOC directly to them.

It was seen that there was excess expenditure compared to the approved grant in respect of over 142 units of appropriation each year as detailed below:

(in numbers)

**Excess expenditure
by diversion of Letter
of Credit.**

Year	1997-98			1998-99			1999-2000		
	Total units	Number of units where excess expenditure incurred	Percentage of Average excess expenditure over provision	Total units	Number of units where excess expenditure incurred	Percentage of Average excess expenditure over provision	Total units	Number of units where excess expenditure incurred	Percentage of Average excess expenditure over provision
Revenue	158	86	15	161	70	16	152	68	7
Capital	212	79	21	283	74	18	265	74	11

The Divisional Officers exceeded the budget provisions under these units of appropriation by diverting unutilised LOCs available under other units of appropriation. Such excess expenditure by diversion was possible due to the following reasons:

(i) Both Budget and LOC were for gross expenditure whereas utilisation of LOC was for net expenditure. As pay bill recoveries and the recoveries on account of Income Tax, Sales Tax, etc., were passed to Government account through book adjustments, the savings on account of this were available to Divisional Officers for diversion.

(ii) Though the Manual provision stipulates issue of LOC based on Budget and approved Revised Estimates (RE), Finance Department issued LOC based on RE proposals. Consequently, when the approved RE was less than the proposal, the utilisation of excess LOC already issued resulted in excess expenditure over budget provision.

(iii) The Regional CEs and SEs were empowered to divert LOCs among the divisions under their control. Such diversion of LOC results in excess expenditure. The authorities, however, failed to regularise this by providing funds by way of re-appropriation.

Illustrative examples of incurring excess expenditure over approved grant furnished in Appendix XXVIII indicated that the Divisional Officers failed to control expenditure within Budget and though they furnished monthly statements of expenditure incurred against each unit of appropriation, the EIC utilised these reports only for the purpose of reconciliation with the accounts figures of AG (A&E) without conducting any review to control the expenditure to be within the Budget allotment. When pointed out, EIC stated that the review would be conducted in future. Thus, there was no control over expenditure.

4.1.4.3 Non-clearance of suspense heads

**Balances under
Suspense heads not
cleared resulting in
non-realisation of
revenue, non-
detection of
malpractices and
misclassifications.**

(a) Miscellaneous Public Works Advance, a Suspense Account that records advance payments, losses, amount recoverable from contractors, officers etc., was to be cleared by recovery, waiver or transfer. As of March 2000, Rs 10.29 crore was pending clearance in 40 divisions. Of this, Machinery Division and PW Workshop in Chennai had a balance of Rs 8.31 crore. Test-check in 6 divisions revealed that out of Rs 48.16 lakh pending as of March 2000 (Rs 36.63 lakh related to 1980 to 1997), only Rs 2.10 lakh was cleared during 2000-2001. Non-clearance of the balance under this suspense head would result in non-realisation of revenue or understatement of expenditure under the final head of account.

(b) The net difference between the remittances accounted in the divisions but not in treasuries and *vice-versa* appears in the Suspense Account 'I - Remittance'. As of March 2000, a difference of Rs 4.69 crore was pending clearance. This is a serious matter because treasuries have acknowledged less remittances than claimed to have been made by the divisions; and investigation of the difference must be made regularly. Test-check conducted in 10 divisions revealed a difference of Rs 5.03 lakh pending as of March 2000 were not cleared even by March 2001 (Rs 1.23 lakh related to 1980 to 1997) and in Vennar Basin Division, Rs 4.29 lakh remitted to Government account in January 1999 and July 1999 were not accounted in the treasury account till March 2001. Any delay in clearing the difference may lead to non-detection of malpractices of non-remittance of revenues to Government Account.

(c) The net difference between the cheques issued by divisions but not cashed in banks and cheques shown as cashed in banks but not shown as issued in divisional accounts are reflected in the Suspense Head 'II - Cheques'. As of March 2000, Rs 114.39 crore is pending under this suspense head. Test-check conducted in 10 divisions revealed that 60 cheques for Rs 16.99 lakh issued between November 1987 and March 2000 were not encashed as of February 2001, though the validity

of cheques was only for six months. Reasons for the difference are required to be analysed for taking corrective action.

4.1.5 Impact Assessment of Programme

Available water resources not utilised effectively.

The objective of the Department was to ensure effective management and distribution of surface and ground water. The Institute of Water Studies prepared a State Framework Water Resources Plan in January 1999 and identified that only 5 out of 16 River Basins (excluding Cauvery Basin) have surplus and Kodaiyar Basin would have surface water surplus even in the year 2050. Besides, out of the estimated total surface water potential of 13015 Million Cubic Metre (Mcum) a quantity of 1703 Mcum flows into sea in five river basins, out of which three are deficit basins. The Plan assessed the efficiency of irrigation system of canals and tanks as 40 *per cent* and envisaged improvement of irrigation efficiency to 50 *per cent* by the year 2019 and 60 *per cent* by the year 2044. The Plan also envisaged diversion of water from surplus to deficit basin, change of cropping pattern, modernisation of irrigation system and rehabilitation of tanks, waste water recycling, construction of water harvesting structures and prevention of sedimentation. Though the Department had taken measures like formation of field channels, lining of supply channels, repairs to shutters, modernisation of canals and tanks to improve the irrigation efficiency under WRCP, it did not evolve any programme based on this Plan as of March 2001.

It was noticed that the rain fall during 1997-98 and 1998-99 was above normal by 18 and 10.1 *per cent* and during 1999-2000 the rain fall was below normal by 8.3 *per cent*. Audit scrutiny revealed that as against the potential of 12.56 lakh ha created under Canal Irrigation, the potential utilised during 1997-2000 ranged between 8.34 and 8.67 lakh ha only. Similarly, the actual potential utilised under Tank Irrigation during 1997-2000 was between 6.33 and 6.90 lakh ha only as against the potential of 10.10 lakh ha created. Test-check revealed the following contributory factors for the short fall in utilisation of irrigation potential created.

(i) The irrigation potential of 5968 lakh ha created under three schemes¹ could not be utilised by the Department due to pollution, flood damage and defective scheme formulation.

(ii) The studies on sedimentation of 15 reservoirs conducted by CE (DRCS) during 1991 to 1998 revealed that the total capacity of the reservoirs was reduced from 23061 Million Cubic Feet (mcft) to 18694 mcft, a reduction of 19 *per cent*.

(iii) As against the irrigation potential of 21168 ha created through 10 projects in Dharmapuri and Virudhunagar districts, the utilisation was only 876 ha and 78 *per cent* of water released for irrigation in these projects was not utilised for cultivation due to defective scheme formulation, poor execution and improper maintenance as discussed in paragraph 4.1.6.

As the non-availability of surface water for irrigation forced the agriculturists to resort to overexploitation of ground water potential, the

¹ Noyyal Orathupalayam Reservoir Project, Lakshmiapuram Anicut across Arniyar river and Formation of tank near Chinnavedampatti Village.

urgent necessity for implementing the plan prepared by the Institute of Water Studies need not be overemphasised.

4.1.6 Working results of completed projects

Irrigation potential envisaged was not created and potential created was not utilised due to poor scheme formulation and huge wastage of water.

The working results of 10 irrigation projects implemented in Dharmapuri and Virudhunagar districts during 1983 to 1993 at a cost of Rs 56.12 crore revealed that as against 21168 ha of new ayacuts proposed to be developed and 1059 ha proposed for stabilisation, only 876 ha (4 *per cent*) were newly irrigated per annum on average and 702 ha were stabilised. The average annual food production was 3307 tonnes as against 56359 tonnes envisaged (details *vide* Appendix XXIX). This was mainly on account of non-creation of irrigation potential envisaged due to poor scheme formulation and non-utilisation of potential created due to poor execution and maintenance as discussed below:

(i) There was insufficient yield in the reservoirs than anticipated in 5 projects² ranging from 65 to 87 *per cent* indicating poor investigation of hydrology of the projects.

(ii) Boosting of anticipated ayacuts to be benefited by 445 ha without availability of water in Kesarigulihalla Reservoir Project.

(iii) The project reports envisaged storing of water in the reservoir for 1.4 to 3.4 times in a year to meet the requirement of the proposed ayacut. It was seen that in spite of good inflow water could not be stored in the reservoir as the yield was seasonal. Consequently, water could not be stored as envisaged and the water realised in excess of the capacity of the reservoir was let into the river (details *vide* Appendix XXX).

(iv) In Vaniar Reservoir Project, the pressure was low to cover the tail end ayacuts of 182 ha as the bed width of the canal at tail end was too large.

(v) In respect of five projects³, the field channels below 10 ha limit were not excavated by Agricultural Engineering Department as required.

(vi) In Anaikuttam and Vembakottai Reservoir Projects, 1861 ha of ayacut were at higher level than the supply channels. Further, 777 ha of ayacut of Anaikuttam Reservoir Project were converted into match factories.

(vii) In spite of incurring Rs 3.42 crore for maintaining the 10 projects during 1991-99, the canals were not maintained properly. There was leakage in the regulator shutters in Anaikuttam Reservoir Project and there was unauthorised drawal of water for industrial purposes in Vembakottai Reservoir Project. Consequently, water was not utilised for irrigation from these projects. The irrigation efficiency of the remaining projects on an average was only 22 *per cent* due to silting of channels, large scale damage to sluice and shutters, damage to lining, etc. (Details

² Vaniar, Thumbalahalli, Kesarigulihalla, Anaikuttam and Vembakottai Reservoir Projects.

³ Anaikuttam, Golwarpatti, Vembakottai, Kullursandhai and Pambar Reservoir Projects.

vide Appendix XXXI). The Divisional Officers stated that funds allotted for maintenance were insufficient.

4.1.7 Programme Management

Fifty projects/schemes taken up during 1982 to 1998 were under progress and Rs 666.68 crore was incurred as of March 2001. Of this, 18 projects/schemes envisaged creation of additional irrigation potential of 12437 ha. The implementation of Tank Modernisation Scheme, Desilting works in Cauvery Delta, System Improvement and Farmer Turnover, a component of WRCP and 9 schemes under execution were reviewed. The important points noticed are discussed below:

4.1.7.1 Execution of unviable schemes

Government sanctioned unviable schemes.

Mention has been made in Paragraph 4.4 of the Report of the Comptroller and Auditor General India for the year ended 1999-2000 - Tamil Nadu (Civil) regarding execution of two unviable schemes which proposed to utilise the surplus of Periyar-Vaigai Project after meeting the requirement of Ramnad Big Tank. It was noticed that two more schemes for providing irrigation facilities to 58 villages in Usilampatti Taluk and to feed Valayankulam and Kambikudi series of tanks in Madurai were sanctioned by Government (Rs 42.75 crore), in October 1996 and June 1999 to utilise the same surplus water. Besides, the scheme of diversion of floodwater of Vaigai river to Rajagambeeram and 15 other tanks in Manamadurai Taluk was also sanctioned in May 1999 for Rs 3.09 crore to utilise the surplus in excess of 15000 cubic feet per second (cusecs). This scheme also was not viable as the required flood flow was realised only for 8 days in four years during 1971 to 2000. All the three schemes were under progress.

4.1.7.2 Unfruitful expenditure on abandoned schemes

The Department has spent Rs 25.83 lakh during March 1998 to July 1999 on the schemes, 'Construction of Anicut across Uppodai' and 'Rehabilitation of leading channel and construction of retaining walls from Thoonakadavu Reservoir to Sarkarpathy Tunnel entry', which were subsequently abandoned due to non-consideration of riparian rights and objection by Government of Kerala for taking up works in their wild life sanctuary.

4.1.7.3 Non-achievement of objectives

Link canal benefits not achieved.

(i) The water realised at Vaigai Dam for irrigating the ayacuts of Periyar system and Vaigai system were carried through the river course upto Peranai Regulator wherefrom the water meant for each system were let into the respective supply channels. With a view to avoid wastage of water in the river and siltation at Peranai Regulator, a lined link canal was constructed in August 1995 at a cost of Rs 35.12 crore connecting Vaigai Dam and Peranai Regulator to carry the water meant for Periyar system. It was, however, seen that out of 1.22 lakh mcft of water realised at Vaigai Dam for Periyar system during September 1995 to March 2001, only 0.34 lakh mcft of water was carried through this canal and the balance 0.88 lakh mcft was let into the river course, defeating the main objective of the construction of the canal. The reason for diverting less quantity of water into the link canal was not furnished.

(ii) A scheme to provide tilting shutters to the existing five weirs, raising the crest level of one weir, construction of one more weir to Maduranthagam Tank and to divert the excess water stored to feed 30 tanks through canals excavated for a length of 33 km was taken up in May 1986. Rupees 8.66 crore was spent for canal works and provision of tilting shutters by October 1996. Pending approval of revised estimate funds were not provided during 1997-2001. Consequently, the work of raising crest level of one weir and construction of one weir were not executed resulting in non-achievement of objective in spite of spending Rs 8.66 crore.

4.1.7.4 Poor scheme formulation

Surplus regulator designed for a less capacity than required.

(i) According to Indian Standard Specifications of November 1985, the surplus regulator for intermediate dams should be designed based on 'Standard Project Storm' (SPS). Though the World Bank consultant arrived at the capacity of the regulator for Irukkangudi Reservoir Project as 23899 cubic metre per second (cumecs) based on the SPS, the CE (Irrigation) designed the regulator for a capacity of 4529.40 cumecs only. As the dam would overtop if the regulator was constructed with inadequate capacity, the World Bank rejected the proposal and the Government took up the project with State funds. The SE (Designs) arrived at the capacity of the regulator as 11365 cumecs based on the maximum one day rainfall of 212 millimetre (mm) in 1981. The technical committee, however, approved (March 1997) the capacity of 5012 cumecs on the ground of economy and submergence of villages and towns on the banks of the river. The project was under progress and an expenditure of Rs 16.38 crore was incurred as of March 2001. Thus, the dam is unsafe for high flood conditions and an abnormal rainfall of 250 mm was actually observed for one day in January 2001.

Scheme formulated without considering riparian rights.

(ii) The CE (Irrigation) proposed to construct a dam across Hanumanadhi river to store 348 mcft of water in two fillings utilising the dependable yield of 600 mcft at the Adavinainar Koil reservoir site. The requirement of water for the project was worked out as 406.08 mcft (balance requirement of 59 mcft was to be met through ground water potential). The project was sanctioned by Government in May 1990 for Rs 37.69 crore. Audit scrutiny revealed that the CE failed to consider the riparian rights of ayacutdars under one Anicut covered under the project and the actual requirement worked out to 590.28 mcft. Thus, the construction of dam with low capacity would result in non-achievement of irrigation potential envisaged in the project.

4.1.7.5 Time and cost overrun

There was cost escalation of Rs 169.61 crore due to avoidable delay in land acquisition and finalisation of design.

During test-check abnormal delay in sending land plan schedules, delay in sanction of prescribed special staff and delay in obtaining permission from GOI for transfer of forest land were noticed in eight cases. Besides increase in the compensation amount, delay also resulted in cost escalation of various components of the project. In addition to delay in land acquisition, delay was also noticed in finalisation of design, formation of diversion road, etc. The details of time and cost overrun are given in Appendix XXXII. The avoidable time overrun in four cases ranged between 3 and 15 years and the total cost escalation in 8 cases was Rs 169.61 crore.

4.1.7.6 Execution of works

4.1.7.6.1 *Delay in finalising the tender*

Construction of additional spillway to Sathanur Dam was completed in September 1999 at a cost Rs 7.30 crore. But the tender for shutters for the spillway called for in March 1997 by PW Workshop was not finalised as of March 2001 as Government had not decided whether the work should be taken up with State funds or under WRCP. Consequently, water was stored only upto 117 feet instead of 119 feet to avoid damage to coffer dam thereby releasing excess water into the river during November and December 2000.

4.1.7.6.2 *Tank Modernisation*

With a view to increasing the efficiency of tank irrigation system and to bridge the gap between the registered ayacut and actual irrigated ayacut through rehabilitation works at supply channel, tank (excluding desilting), distribution net work and on-farm development, the Department implemented Tank Modernisation Project from June 1984 in 649 rain fed tanks at a total cost of Rs 179.35 crore. Audit scrutiny revealed the following:

Objectives of tank modernisation not achieved.

(i) The evaluation of the project conducted by Anna University during 1994-2000 revealed an increase in the irrigation efficiency of channels but the report failed to evaluate the actual gap bridged. Test-check revealed that there was still large gap between the registered ayacut and actually irrigated ayacut. The revenue records of 16 out of 21 tanks in three districts where the project was implemented revealed that there was reduction in the irrigated area compared to pre-project period in spite of normal rainfall. The reasons attributed for the reduction were non-taking up of agriculture by farmers, and conversion of ayacuts into house sites, etc. Thus, increasing the efficiency of irrigation had not contributed to the increase in the irrigated area and the objective of the project was not achieved.

(ii) The construction of office building for Project Management Unit at Chennai proposed to be constructed in Phase II (1989-96) using State funds, was actually commenced in July 1998 for completion in September 1999 at the fag end of the project. The building was completed at a cost of Rs 51.74 lakh in December 1999. Similarly, a training centre at Tharamani was constructed at a cost of Rs 27.07 lakh in December 1999 only, but used as a godown (March 2001).

(iii) Out of Rs 87.36 lakh paid to Irrigation Management Training Institute during 1992-93 to 1999-2000 for providing training to farmers, Rs 21.35 lakh were not utilised and also not refunded as of March 2001.

4.1.7.6.3 *Desilting of river, drains, channels and tanks in Cauvery delta*

With a view to obtain free flow of water in rivers, drains and channels to the tail end and minimising the damage due to floods, the Government

launched the scheme of removal of Ipomea, desilting of river, drains, channels and tanks in Cauvery delta during 1997-98 and spent Rs 68.69 crore during 1997-2000. As of February 2001, 9151 kilometre (km) of rivers, drains and channels were desilted leaving a balance of 11176 km.

(i) Poor planning

(a) The Department formulated the scheme without assessing the total length of the rivers, drains and channels required to be desilted and the cost. The total length of waterways mentioned in the proposals for 1997-98 and 1999-2000 and the details furnished in February 2001 to Government varied widely as under:

(in kilometre)

The project was formulated without assessing the requirement and cost

	1997-98	1999-2000	February 2001
Rivers	1569	1482	2030
Drains	784	3108	6203
Channels	11000	12600	12094

Due to poor formulation the Department could not complete the work by July 2001 as proposed and there was a balance of 9704 km to be desilted as of March 2002.

Desilting works executed without any plan

(b) CE, Thiruchirapalli obtained *ad hoc* sanction every year without mentioning the specific areas to be desilted and allocated the funds to the executing divisions fixing only financial targets. However, the selection of the area of execution was left to the EEs. In January 1999, CE, Thiruchirapalli issued instructions that the estimates for desilting should cover water course from head to tail without leaving gap. It was, however, seen that EEs prepared a number of estimates for executing the work in different areas under their control leaving gaps between each stretch and executed some gaps during subsequent years. The execution of desilting works without planning would not serve the intended purpose.

(ii) Execution of works

(a) The CE, Thiruchirapalli assessed (February 1997) the number of machines required for desilting the proposed length and rent payable for the machines and worked out the cost of desilting for each year for obtaining Government sanction. In March and April 1998, Government issued specific instructions that the proposal should include the actual work proposed to be undertaken and benefits to be accrued. For this purpose, a shelf of works should be identified and detailed estimates of the works should be prepared during the lean season as desilting works could be done only during March to July. In spite of the instructions, the proposals were sent only on *ad hoc* basis and were approved by Government.

(b) While sending proposals for 1997-98, the SE adopted the outturn for dozers as 22.6 metre per hour for rivers and drains and 160.7 metre per hour for channels, whereas the CE in his proposal to Government revised the outturn as 6 metre and 30 metre per hour respectively which resulted in inflation of the project cost.

The estimates for desilting were abnormally boosted

(c) As there was no separate schedule of rates for earthwork excavation using machinery, the estimates were prepared based on schedule of rates for manual excavation. While tenders were called for from private contractors on quantity basis, the works were entrusted to Agricultural Engineering Department (AED) on the basis of hire charge of machinery. In as much as the Department has executed desilting works in rivers, drains and channels using AED machinery during 1995-97, the Department should have prepared the estimates based on outturn of AED machinery. Audit scrutiny of 138 works executed by AED during 1996-97 revealed that the outturn of dozer was 13.3 metre per hour and the average cost of desilting per km was Rs 0.45 lakh. However, the average estimated cost for 1997-98, 1998-99 and 1999-2000 were Rs 1.69 lakh, Rs 1.84 lakh and Rs 1.95 lakh per km respectively. Thus, the estimates were very high, compared to actual expenditure incurred on the same work in 1996-97.

(d) Contrary to the Manual provisions, the EEs of two divisions⁴ entrusted 19 works during 1997-99 to Tamil Nadu Agro Engineering and Service Co-operative Federation Limited on nomination basis, at an estimated cost of Rs 50.77 lakh without obtaining permission from Government. When permission was sought during 1999-2000 and 2000-2001, Government rejected the proposals. The boosted estimates had resulted in extra expenditure.

(e) Government permitted splitting up of works into convenient reaches to speed up the works through different agencies. Consequently, the reaches were split up and sanctioned within the powers of EE, SE and CE. The following was the trend of test-checked tenders:

Sanctioned and awarded by	Trend of participation (Test check : 980)					Trend of offers (Test check : 1508)					
	Single	Two	3 to 5	Above 5	Total	More than estimate 0 to 5	Estimate	Less than estimate			Total
								Upto 20 per cent	20-50	50-70	
CE and SE	3	56	111	94	264	149	--	94	192	7	442
EE	21	585	64	46	716	476	57	436	93	4	1066
Total	24	641	175	140	980	625	57	530	285	11	1508

It could be seen from the above data that 68 per cent of the tenders was responded by one or two contractors mainly when the estimated value of the tender was within powers of EE. Test-check of 322 tenders of 1998-99 in two divisions revealed that two tenderers participated in 290 cases of which the same 42 pairs of tenderers were involved in 253 cases. Similarly, 45 per cent of tenders invited by CE and SE fetched discounted offers, mostly more than 20 per cent below estimate. The trend of discounted tenders was 5, 84 and 100 per cent during 1997-98, 1998-99 and 1999-2000 respectively. The increase in competition and discounted tenders year after year clearly indicated that the estimates were very high.

⁴ Agniyar Basin Division, Pattukottai and Cauvery Basin Division, Thanjavur

(f) The physical and financial achievements during 1997-2000 were as under:

(Rupees in lakh)

	1997-98			1998-99			1999-2000		
	Physical (in km)	Financial	Cost per km	Physical (in km)	Financial	Cost per km	Physical (in km)	Financial	Cost per km
Rivers and Drains	872.03	686.73	0.79	1261.96	1612.40	1.28	1943.28	2281.30	1.17
Channels	830.65	363.39	0.44	611.72	376.26	0.62	1105.74	441.22	0.40

Execution of desilting work through private contractors without arriving at the outturn of Government machines resulted in extra liability of Rs 23.09 crore.

Though 95 *per cent* of the offers for 1997-98 was above the estimated cost, the average cost per km was very low mainly because considerable portion of work was done through AED by hiring machinery. Though Government specifically ordered to execute the works mainly through Government machines during 1997-98, no such instruction was issued while sanctioning funds for 1998-99 and 1999-2000. The Department utilised the AED machines mainly to desilt tanks during 1998-2000 on the ground that the Government machines were not suitable for desilting rivers, drains and channels. This contention was, however, not factual as AED machines were utilised for these works during 1995-98. As the average cost per km for desilting through AED machines was Rs 0.45 lakh and the rent for machines was increased by 10 *per cent* on an average by AED, the rate for 1997-98, 1998-99 and 1999-2000 would be Rs 0.50 lakh, Rs 0.55 lakh and Rs 0.60 lakh per km. However, the contractors were paid Rs 1.36 lakh, Rs 1.25 lakh and Rs 1.19 lakh per km during these years. Compared to the rate of AED, extra liability incurred on execution of work through private contractors would work out to Rs 23.09 crore in respect of rivers and drains during 1997-2000. Incidentally, it is pointed out that no departmental machines were used on this work though 7 dozers were kept idle in working condition in Machinery Division.

(g) Based on the rates quoted by the contractors, the CE, Thiruchirapalli, approved (March 2000) schedule of rates for desilting using machinery for the Circles under his control. It was seen that though the same rate of Rs 16 per cubic metre (cum) was approved for Middle Cauvery Basin (MCB) and Lower Cauvery Basin (LCB) Circles for the year 2000-2001, MCB Circle provided for reduction of 25 *per cent* of this rate, if the depth exceeded 75 cm. The SE, LCB Circle, however, obtained a common rate on the ground of difficulty in taking measurements.

Executive Engineers failed to lease the desilting areas for sand quarrying.

(h) As the lease period of sand quarries in Thanjavur, Tiruvarur and Nagapattinam districts expired in March 1998, the respective District Collectors specified some reaches of rivers and drains and sought the concurrence of EEs of LCB Circle for leasing them out as sand quarries. The EEs, however, did not agree on the ground that the deposit of sand in delta river was very meagre and due to indiscriminate quarrying of sand, bed levels of rivers had gone down affecting irrigation. When the Collectors insisted for allowing sand quarrying on lease where silting was prominent, the EEs gave concurrence for a few reaches. It was, however, seen that the EEs prepared estimates for desilting in reaches which were specified by the Collectors for sand quarrying but

permission not given by them. Test-check revealed that the EEs incurred Rs 1.76 crore in desilting 23 such reaches. Incidentally, it was noted that the Collector, Thanjavur, earned Rs 2.05 lakh by auctioning the sand heaps formed by desilting operation. Thus, the refusal of the EEs to permit sand quarrying, but desilting in these reaches resulted in not only avoidable expenditure on desilting but also loss of revenue by way of seigniorage charges.

(i) In spite of SE's instructions in April 1998, two sample divisions did not maintain records showing the machines deployed for the work, period, quantity and value for each work. Besides, permanent records showing the details of desilting to avoid overlapping and for future maintenance were also not kept. Test-check revealed that two reaches in Kannanar Drain were desilted by two different divisions and the SE had not furnished any reply to audit remarks.

4.1.7.6.4 Tamil Nadu Water Resources Consolidation Project

The project was approved for World Bank assistance of Rs 840.10 crore from January 1996 for completion by March 2002. The component 'System Improvement and Farmer Turnover' for which 54.5 *per cent* of the total fund was allocated was aimed to rehabilitate the distribution system by lining of canals and improvements to head works and handing them over to farmers' organisations for maintenance.

The implementation of this component in Pollachi and Madurai regions revealed the following

(i) System Improvement

(a) The bid documents provided for following Indian Standard Specifications (ISS) in the execution of various items of work. However, SE Madurai and Pollachi did not strictly follow the ISS in the preparation of bid documents and instructions to the contractors. Consequently, the Department incurred additional expenditure as under:

(i) ISS provides for the minimum cement level of 250 kg/cum for a water cement ratio not exceeding 0.6 and if this limit is maintained strictly, the cement level could be reduced by 10 *per cent*. Though the SEs stipulated maintenance of water cement ratio not exceeding 0.6 in the bid document and agreement, they, however, prescribed the cement level of 250 kg/cum instead of 225 kg/cum without reducing 10 *per cent* cement level. This deviation resulted in extra usage of cement of 25 kg/cum. The extra expenditure in 73 test-checked works worked out to Rs 2.24 crore. When pointed out, the CE, Pollachi stated that the water cement ratio of below 0.6 could not be maintained due to constraints of workability. This contention was not tenable as according to the principles of physical properties of concrete, workability of concrete with water cement ratio of 0.6 and less could be obtained if compaction was done by machinery and the contract provided for mixing and compaction only by machinery.

(ii) Though the ISS provided for 50-60 mm thick Plain Cement Concrete (PCC) for bed and sides of the canals having a discharge upto 5 cumecs, SE, Pollachi provided 65 mm thick PCC for such

Failure to adhere to the prescribed specifications resulted in extra expenditure of Rs 3.51 crore.

distributories in 14 works incurring an additional expenditure of Rs 1.27 crore.

Payment of Rs 1.85 crore was made through supplementary contract though the items of work formed part of the original contract.

(b) In the following cases, the SE, Pollachi approved supplementary contract for works which were already included in the original contract.

(i) Though the rate quoted by the contractor for concreting included all works required for the concrete construction as per the original agreement, the SE, Pollachi ordered to pay Rs 79.19 lakh for shuttering in the work of 'Rehabilitation of Contour Canal, Parambikulam Aliyar Project'. The amount was paid by the division.

(ii) According to the agreement, the item of work 'Preparation of sub grade and laying cement concrete' included trimming. However, the EEs, Pollachi and Udumalpet sent proposals for separate payment for trimming as additional item on the plea that trimming was not included in the original data for preparation of estimate. Though the Deputy SE pointed out that this work was not an omission as the agreement provided for it, the SE, Pollachi approved the proposals of the EEs. Consequently, Rs 1.06 crore was paid to the contractors in nine packages.

Inadmissible payment of secured advance resulted in unintended benefit of Rs 1.02 crore to contractors.

(c) According to the model bid document, interest free secured advance was not payable for cement which is perishable. The EEs, Pollachi, Parambikulam and Udumalpet paid Rs 17.89 crore to 21 contractors in 40 packages as secured advance for cement and effected recovery on its utilisation in the works. This inadmissible payment resulted in unintended benefit of Rs 1.02 crore to the contractors at 18 *per cent* rate of interest prescribed by Government for advances paid to contractors for mobilising men and material.

(d) In the estimate for the work of Rehabilitation of Puthen Dam approved by CE, Madurai, provision was not made for filling of deep gorge and removal of rock outcrop in the Apron portion, removal of bund to connect wing wall to canal and clearing of obstruction in the river course which are foreseeable items. Consequently, these works were executed as additional items resulting in extra expenditure of Rs 9.65 lakh due to change in schedule of rates in the year of execution.

(e) According to ISS, concrete membrane was to be provided on the upstream side of the storage dams to control seepage. Accordingly, in the estimate for the work of rehabilitation of Puthen Dam, a diversion weir, Coursed Rubble (CR) Masonry only was provided on the upstream side of the extended portion of the spillway and downstream of the weir as a seepage control measure. During execution, World Bank consultant recommended replacement of CR masonry on the downstream side with concrete membrane. However, the SE (Designs) revised (November 1999) the design of upstream side also resulting in an avoidable extra expenditure of Rs 10.57 lakh. Incidentally, it was noticed that the upstream side of the original spillway had only cut stone masonry.

Delay in finalisation of tenders resulted in avoidable liability of Rs 77.22 lakh.

(f) In the case of contracts not subject to price adjustment, if the period of bid validity (90 days) is extended beyond 60 days, the amount payable to the bidders selected for award should be increased by 6 *per cent* for the period of delay beyond 60 days upto the notification of award. Test-check revealed that there was a delay of 10 to 346 days in

finalising 23 out of 138 tenders resulting in avoidable liability of Rs 77.22 lakh.

(ii) Farmer Turnover

This sub-component of WRCP aimed at decentralisation of maintenance of irrigation system. For this purpose, WRCP envisaged forming of Farmers Councils (FCs) (for 500 ha level to maintain and protect distributory canals and structures and to assist WRO in planning system) with the assistance of Non-Government Organisations, registering them, collecting Rs 250 from members for utilising the interest for maintenance, providing training to the FCs in maintenance and handing over the assets to them after entering into a Memorandum of Understanding. WRCP also envisaged completion of 9 ongoing schemes, rehabilitation of irrigation system upto distributory level, collection of 20 *per cent* lining cost in respect of distributory system already rehabilitated under National Water Management Project and construction of masonry/concrete structures at critical locations of field channels. The maintenance of canals upto Branch Canal was to be done by WRO. The following observations are made:

Ayacuts to an extent of 4.51 lakh hectares were not handed over to Farmers Councils for maintenance.

(a) WRCP envisaged handing over of 5.63 lakh ha of ayacuts under WRO except Cauvery Basin to the FCs to be formed in a phased manner from 1995-96 onwards. As against the target of 4.84 lakh ha, only 0.39 lakh ha had been handed over by January 2001. It was seen that the Department formed 1178 FCs to cover 4.90 lakh ha only as of January 2001 and proposed to hand over the remaining 4.51 lakh ha by September 2001. The reason for non-formation of FCs for the remaining ayacuts was not on record. The problems encountered by not handing over to FCs as planned are discussed below.

(i) The formation of FCs was affected mainly due to the presence of Water Users Association (WUA) formed under Centrally sponsored "Command Area Development Programme" for maintaining ayacuts below 40 ha with the grant of Rs 225 from GOI and Rs 225 from the State and farmers' contribution of Rs 50. Consequently, the Department converted all the WUAs into FCs, but this affected the collection of Rs 250 from the members of newly formed FCs. Besides, farmers also experienced financial difficulty for contributing their share. The Department had not found any solution to these problems as of March 2001.

(ii) The ongoing schemes were not completed as scheduled in WRCP and the rehabilitation of waterways upto distribution level could not be completed mainly due to short working seasons available after the closure of irrigation systems every year.

(iii) The project did not provide for repair works below the distributory level which were insisted by FCs for taking over the assets. The Department, with the approval of World Bank (May 2000), decided to execute 'Minimum Distribution System Rehabilitation Package' through the FCs before handing over.

Farmers contribution of Rs 43.93 lakh was not collected.

(b) In respect of 3 works where lining was involved in rehabilitation of distribution canals, the EEs failed to collect the 20 *per cent* contribution of farmers in respect of lining portion resulting in non-collection of Rs 43.93 lakh. Of these three works, Government failed to include the condition in one work and one work was stopped midway

after incurring Rs 55.45 lakh as the EE could not collect the farmers' contribution as insisted by Government.

Thus, the objective of handing over the maintenance of assets to the FCs was not fulfilled. As the funds allotted by Government for maintenance of irrigation systems was mainly consumed for electricity, maintenance of dams and wages to work-charged establishment, the maintenance was poor. Government, in March 2001, sanctioned Rs 15.13 crore for payment to FCs at Rs 100 per ha so that the maintenance work could be taken up by them. However, as the assets were not handed over to FCs, the maintenance of irrigation system could not have been carried out.

4.1.8 Manpower Management

Consequent on the creation of WRO, Government issued orders (August and November 1995 and January 1996) sanctioning the posts of CE, SE and EE along with supporting staff by redeployment of the then existing staff. As of March 2001 the post of one EIC, 10 CEs, 29 SEs in charge of circles, 107 EEs in charge of divisions and 14916 supporting staff including 4973 work-charged establishments were sanctioned. The men-in-position as against the sanctioned strength was not available with EIC. Test-check revealed that 20 divisions under four circles⁵ in Madurai region had a supporting staff strength of 1334 against sanction of 1631 (excluding work-charged).

No assessment of staff requirement was made to identify the actual requirement.

Government while sanctioning 107 divisions during re-organisation (January 1996) stated that the posts sanctioned would be continued beyond September 1996 only on the recommendation of an Expert Group to be constituted for justifying the work load. However, Government sanctioned (May 1997) the continuance of the staff till September 1999 without any such recommendations and even the Committee constituted to justify the work load of each division for its continuance beyond September 1999 had not made any realistic assessment of cadre strength based on any norms and recommended constitution of an Expert Committee for this purpose. Consequently, Government approved the continuance of posts for one year and ordered the EIC to furnish full details of utilisation of sanctioned posts along with continuance proposals beyond October 2000. The EIC was also requested to review Workshop and Stores division and review norms in regard to Office Assistants (OAs) and other staff and send suitable proposals to Government. The EIC, however, had not sent any such proposals/details but obtained sanction for continuance of posts monthly for drawal of pay and allowances till July 2001. Government in August 2001 ordered for the continuance of staff upto September 2001.

Thus, the Government had not made any attempt to identify the actual requirement of the re-organised WRO wing and allowed to continue the divisions and other supporting staff without any norms.

⁵ Periyar-Vaigai Basin Circle, Madurai; Vaippar Basin Circle, Virudhunagar; Thamiraparani Basin Circle; and Project Circle, Tirunelveli.

The following points were noticed:

There was an excess establishment expenditure of Rs 19.87 crore.

(i) The territorial divisions had an average work load of Rs 2.93 crore to Rs 4.67 crore per annum and no attempt was made to have equal distribution of work load. Test-check revealed that in seven divisions, the manpower employed was far in excess of requirement resulting in an excess expenditure of Rs 19.87 crore as detailed in Appendix XXXIII.

Failure to surrender surplus Office Assistants resulted in annual additional expenditure of Rs 1.01 crore.

(ii) Finance Department specified norms for employment of OAs in September 1995 and directed the Heads of Department to surrender the surplus OAs to the District Collectors concerned for redeployment. It was noticed that CE, Chennai, Madurai and Pollachi and O&M, SE, TM Circle, Thiruchirapalli had identified 331 surplus OAs under their control only during January to May 2000 and they were not surrendered even by March 2001. During test-check, it was seen that though the four divisions⁶ reported a surplus of 41 OAs, the actual surplus as per the norms was 61 OAs. Test-check conducted in Collectorate of Chennai revealed that there was no surrender of surplus OAs by EIC. Thus, in spite of specific norms, the WRO continued to employ excess OAs resulting in an annual additional expenditure of Rs 1.01 crore.

4.1.9 Monitoring

The Regional CEs failed to monitor the progress of expenditure with reference to Budget and the progress of acquisition/ alienation/ transfer of land required for the projects. The CE (DRCS) failed to provide technical guidance and the works were executed without following Indian Standard Specifications. The CE (O&M) had not monitored the handing over of the irrigation system from distributory level to the Farmer's council for maintenance as envisaged in WRCP. The baseline survey required to assess the impact of WRCP was not conducted. In spite of Government instructions no norms were evolved for employing manpower in the Department. The EIC who was to monitor the activities of the Department failed to take remedial measures to overcome the above deficiencies.

The above points were referred to Government in August 2001; reply had not been received (September 2001).

⁶ Araniyar Basin; Lower Palar Basin; Lower Bhavani Basin; and Bhavani Sagar Dam divisions.

SECTION – B
AUDIT PARAGRAPHS

HIGHWAYS DEPARTMENT

4.2 Avoidable extra expenditure due to adoption of higher specifications

In the work of Improvements to Radial Roads leading to Chennai City, the specifications prescribed by Indian Roads Congress and the guidelines issued by Ministry of Surface Transport were not adopted resulting in avoidable extra expenditure of Rs 5.85 crore.

Indian Roads Congress (IRC) Specifications prescribe guidelines for evaluating the strengthening requirements of existing roads adopting Benkelman Beam Deflection Technique. For construction of new roads/widening of existing roads, IRC specification prescribe the thickness of the road based on the traffic intensity and the strength of the sub-grade soil. According to the guidelines issued in May 1989 by the Ministry of Surface Transport (MOST), the thickness of paved shoulders¹, if constructed simultaneously with the central pavement, should be the same as that of the main carriage way.

Government, in December 1997, accorded administrative approval for Rs 212.54 crore for “Improving eight radial roads leading to Chennai City”. Seven works were completed and one work was nearing completion as of June 2001. Test-check of records of the Chief Engineer (Highways), Mechanical, Chennai (CE) relating to the execution of works revealed the following instances of non-adoption of IRC specification/ MOST guidelines.

(i) In respect of eight works, the thickness required for strengthening as per IRC specifications ranged between 0 and 65 millimetre (mm) of Dense Bituminous Macadam (DBM) and 25 mm of Semi-Dense Bituminous Concrete (SDC). The approved estimate, however, provided 75 mm thick DBM and 25 mm thick SDC uniformly. The excess provision of DBM resulted in extra expenditure of Rs 2.34 crore as indicated in Appendix XXXIV. When pointed out, the Superintending Engineer, Highways and Rural Works, Chennai (SE) stated (August 2000) that the strengthening portion and widening portion of the road were designed with the same thickness to have a homogeneous section and the usual practice of laying Bituminous Macadam was either 50 mm, 75 mm or 100 mm. The reply was not tenable as the MOST specification provide for laying a single layer of DBM for any thickness ranging from 50 mm to 100 mm and the widening portion should have been aligned with reference to the thickness of the strengthening portion.

(ii) The execution of widening works in four roads revealed that though the consultants recommended 150 mm thick granular sub-base based on IRC specifications, the CE provided 200 mm thick sand gravel

¹ Paved shoulders on either side of the road are provided for overtaking manoeuvres, movement of slow moving vehicles and for lending structural support.

mix as sub-base resulting in extra expenditure of Rs 38.87 lakh as indicated in Appendix XXXV.

(iii) As per the MOST guidelines, the typical design of a paved shoulder should be granular sub-base of suitable thickness, water bound macadam in three layers of 75 mm each and a bituminous wearing course. The texture of the top surface of the shoulders should be different from the main carriageway to ensure clear contrast between them. The CE failed to adopt the guidelines while designing paved shoulders for all the eight road works and provided the same composition for widening the main carriageway as well as paved shoulders. The adoption of richer specification resulted in avoidable extra expenditure of Rs 3.12 crore as indicated in Appendix XXXVI.

The matter was referred to Government in May-June 2001; reply had not been received (September 2001).

4.3 Unfruitful expenditure due to poor planning

Failure of the Chief Engineer to assess the funds required for providing inner ring road in Hosur Town and obtain Government approval resulted in stoppage of the work for want of funds and consequent unfruitful expenditure of Rs 1.94 crore on partial execution of the work, besides non-achievement of the objective of relieving traffic congestion.

According to the codal provisions, revised estimate for a scheme shall be submitted when the sanctioned estimate is likely to be exceeded by more than 5 *per cent* and the contract for execution of a work shall not be awarded unless funds have been provided for it or an assurance for such provision is obtained before the liability matures.

Government sanctioned (May 1986) the work of “Construction of an inner ring road in Hosur Town” for Rs 72 lakh to relieve traffic congestion in Hosur Town by diverting the vehicular traffic from three district roads to NH 7 at the starting and ending point of Hosur Town and to provide quick transport facility for the industries in and around Hosur Town. The scheme provided for acquisition of 18.388 hectares (ha) of private land and alienation of 5.648 ha of land from Government institutions/bodies¹. The Divisional Engineer (NH), Dharmapuri (DE) initiated action for acquisition/alienation of the land for the scheme in 1987-89 and took possession of private land (excluding a portion under encroachment) by January 1994.

In the meantime, due to escalation in cost of materials and labour and increase in land acquisition cost, the Chief Engineer, National Highways (NH), Chennai (CE) obtained Revised Administrative Sanction (RAS) for Rs 1.94 crore (Rs 0.75 crore for land and Rs 1.19 crore for work) from Government in April 1993. The work was split up into two reaches, but the tenders called for in July 1994 were cancelled due to

¹ Tamil Nadu Housing Board (TNHB), Tamil Nadu Electricity Board (TNEB), Small Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) and Railways.

errors in the working estimates. The tenders, called for in April 1995 and recommended by the CE in January 1996, were approved by the Government in March 1996 for Rs 1.80 crore. The work taken up in April 1996 was stopped in April 1998 at different stages for want of funds. The CE sent (August 1998) the revised estimate for Rs 5.62 crore which was approved by Government in December 2000. The balance works were not taken up for execution as of March 2001.

Scrutiny of the records revealed the following failures:

(i) When the CE recommended the tenders in January 1996, Rs 1.32 crore had already been spent mainly for acquisition of land and only Rs 0.62 crore was available as against the tender cost of Rs 1.80 crore. Besides, there were a number of court cases claiming higher compensation for land acquired. Further, the land cost for alienation was not settled and the lands were not taken possession by the DE. The CE, without seeking approval for another revised estimate by assessing funds required to complete the scheme, recommended the acceptance of tender for Rs 1.80 crore for the work, when only Rs 0.62 crore could be provided in the budget for the scheme. This resulted in stoppage of work for want of funds.

(ii) As of March 2001, the DE had not taken over the land from TNEB, Railways, SIPCOT and TNHB due to non-payment of land cost. While the land cost payable to TNEB and Railways had not been finalised, SIPCOT cancelled their land allotment due to non-payment of land cost. TNHB demanded the land cost with interest before the land could be handed over. In addition, the encroachment was also not removed.

Thus, the failure of the CE to send another proposal for RAS in March 1996 itself and non-alienation of land resulted in stoppage of work and unfruitful expenditure of Rs 1.94 crore, as the roads so far laid were not connected to the three district roads.

When this was pointed out, the CE attributed (June 2001) the delay mainly to non-availability of funds and stated that the local people are using the road and hence the expenditure was fruitful. This contention was not tenable as the CE failed to prepare the Revised Estimate fully knowing that funds sanctioned in the first RAS would not be sufficient to execute the works and the objective of diverting traffic from three district roads was not achieved as the road was laid in intermittent stretches.

The matter was referred to Government in April 2001; reply had not been received (September 2001).

4.4 Unfruitful expenditure due to faulty design

Failure of the Department to provide correct design for the causeway across the Palar river in Kancheepuram district resulted in repeated damages and rendered expenditure of Rs 1.87 crore incurred unfruitful besides non-achievement of the objective of the scheme

Government approved (January 1989) the construction of a causeway across Palar river in Kancheepuram district for Rs 60 lakh. Considering

the velocity of water flow, the causeway was designed as a vented causeway with 170 rows of 900 mm diameter (dia) pipes to discharge the flow from upstream to downstream without causing damage to the body walls. However, due to high cost (Rs 1.65 crore), the design was revised and the Chief Engineer, East Coast Road and Rural Roads approved (April 1993) a bed level causeway without any vent at a cost of Rs 1 crore.

The work was awarded (March 1995) for Rs 1.52 crore and a revised administrative sanction for Rs 1.89 crore was obtained. During execution, the design was again revised to provide 20 vents with 900 mm dia pipes, as the causeway was damaged in 1996 floods. Even this design could not withstand the 1997 floods and the design was again revised (March 1998) to provide 50 vents with 900 mm dia pipes. However the causeway was again damaged in the vented portion in November 1998 floods and as the contractor refused to redo the works, the contract was foreclosed (June 1999) at the risk and cost of the contractor after spending Rs 1.87 crore.

The joint inspection (December 2000) by Chief Engineer (CE), Highways (Design and Investigation), Director, Highways Research Station and CE, Highways (Project II) revealed that the vent provided by the pipes was not sufficient for the velocity and water pressure during flood conditions and it was proposed (March 2001) to provide vent with solid slabs and piers in the breached portion at a cost of Rs 1.61 crore. The proposal was not yet approved (May 2001).

It was also observed that the contractor refused to rectify the damage at his cost stating that the damage was due to faulty design. Thus, adoption of a faulty design resulted in non-achievement of the objective even after spending Rs 1.87 crore and the chances of recovery of Rs 31.29 lakh towards the cost of damage from the contractor were also remote.

The matter was referred to Government in May 2001; reply had not been received (September 2001).

4.5 Fictitious payment and extra expenditure on improving a road

Though the width of Vandalur-Walajabad road was increased from 5.5 metre to 7 metre under Radial Roads Scheme, payment was made for widening by 2 metre resulting in a fictitious payment of Rs 23.04 lakh; besides there was extra expenditure of Rs 1.38 crore on unnecessary provision of Dense Bituminous Macadam.

The work of permanent restoration of flood affected Vandalur – Walajabad road from kilometer (km) 30/4-52/0, which included widening and strengthening the existing road, was executed during June 1997 to July 1999 by the Divisional Engineer (Highways and Rural Works), Chengalpattu at a cost of Rs 2.03 crore. As Government sanctioned Rs 2.13 crore in December 1997 for improvement of Radial Roads (RR) in Chennai city including two-laning and strengthening of

Vandalur-Walajabad road from km 30/4-63/8, the ongoing Flood Damage Restoration (FDR) work was foreclosed in August 1999.

Scrutiny of the records relating to execution of both the works revealed the following:

(i) Under the FDR work, the existing carriageway on Vandalur – Walajabad road was widened from 3 metres to 5.5 metres in the reach from km 39/0-52/0. This stretch of the road was also taken up for widening to have a uniform width of 7 metres under RR Scheme. Though the road was required to be widened by 1.5 metres only, it was shown to have been widened by 2 metres under RR scheme. Scrutiny of the measurement books relating to the said work revealed that the total width of the road after widening was only 7 metres. Thus, the road was only widened by 1.5 metres but the payment of Rs 23.04 lakh was made for additional 0.5 metre which was fictitious (Appendix XXXVII). When this was pointed out, the Chief Engineer (Highways), Mechanical, Chennai (CE) stated (August 2001) that due to edge breaking of the bituminous surface, the widening work was taken up for 2 metres width. The reply appears to be an afterthought as the measurement books revealed reconstruction of the road from sub-base level in the widening portion and there was no measurement for removal of the existing road upto the bottom layer, indicating that there was no edge breaking.

(ii) As the road from km 33/0-52/0 was strengthened under FDR work and was in good condition, no overlay provision was made in the investigation report of RR Scheme by the consultant. However, while sanctioning the estimate, an overlay of 75 millimetre (mm) Dense Bituminous Macadam (DBM) was provided in addition to 25 mm Semi-Dense Bituminous Concrete in this stretch. Hence the provision of 5955 cubic metre of DBM was avoidable in this stretch resulting in extra expenditure of Rs 1.38 crore. The CE stated that as per the projected traffic intensity, the thickness required was 680 mm and as there was a deficiency of 80 mm, DBM for 75 mm was provided. The reply was not tenable as the consultant had taken into account the traffic intensity to arrive at the required thickness as 420 mm and hence there was no deficiency.

The matter was referred to Government in June 2001; reply had not been received (September 2001).

4.6 Extra expenditure due to defective estimation

The Department proposed to lay Water Bound Macadam instead of Lean Bituminous Macadam for strengthening the existing surface of a road resulting in change of specification during execution and extra expenditure of Rs 42.04 lakh.

The work of 'Improvements to Mount-Poonamallee Road' was sanctioned by Government in September 1997 for Rs 9.02 crore. It was entrusted as a deposit work to Highways and Rural Works Department by Chennai Metropolitan Development Authority. The estimate for the work approved in November 1997 by the Chief Engineer (Highways), Designs and Investigation (CE) for Rs 13.33 crore provided for, among other things, laying 150 mm thick Water Bound Macadam (WBM) over

the existing black top surface by furrow cutting and provision of Lean Bituminous Macadam (LBM) for profile corrective course. The agreement rate for LBM was Rs 1470 per cubic metre (cu.m). The work was entrusted to a contractor in January 1998.

During the review meeting held in December 1998, the contractor stated that furrow cutting in the existing surface and laying WBM over that may not be possible due to heavy flow of traffic and even if it was done, it would not withstand heavy traffic. Instead, he suggested laying 150 mm thick LBM over the existing bituminous surface and deletion of furrow cutting and laying WBM. The proposal of the contractor was accepted after conducting traffic census and the revised work of laying LBM was entrusted at Rs 1863.60 per cu.m and completed in August 2000.

As the intention was to strengthen and widen the road to ease the heavy traffic and the CE was aware that this traffic could not be diverted, he should have provided LBM instead of WBM while preparing the estimate. This failure led to subsequent change to LBM resulting in avoidable extra expenditure of Rs 42.04 lakh for providing 10680 cu.m of LBM.

The matter was referred to Government in March 2001; reply had not been received (September 2001).

4.7 Extra expenditure due to provision of higher thickness for a road

Provision of higher thickness for Thiruneermalai - Thirumudivakkam road though the traffic census warranted only less thickness had resulted in extra expenditure of Rs 37.85 lakh.

According to Indian Road Congress (IRC) Specifications, periodic traffic census operations are to be carried out for highway planning and for this purpose, every road shall be divided into convenient sections, each carrying approximately similar traffic between points of substantial traffic changes. The design thickness of the road shall be deduced from the total cumulative standard axles of traffic to be carried during the design life of the road, which is based on the movement of commercial vehicles per day on the road as revealed from the traffic census.

While according technical sanction (September 1997) for improving the Pallavaram-Thiruneermalai-Thirumudivakkam road from kilometre (km) 20/8 to km 28/0 connecting NH 45 at km 20/8, the Chief Engineer (Highways), Designs and Investigation, Chennai, computed that 30 Million Standard Axle (MSA) traffic would flow on the road during the design life of 10 years which was based on the traffic of 2045 commercial vehicles in the census conducted in 1993 at km 21/0. As the traffic census conducted at km 25/2 in 1996 which represented the traffic between km 24/8 and km 28/0 revealed a traffic of 678 commercial vehicles only, the traffic beyond km 24/8 was estimated at 9 MSA only during the design life period. However, the Chief Engineer proposed a uniform thickness for the entire stretch on the ground that there would be heavy traffic beyond km 24/8 due to development of

Industrial Estate at Thirumudivakkam. The assumption of the Chief Engineer was not based on facts as major portion of the traffic assessed at km 21/0 flow to the industrial units situated before km 24/8 and the traffic beyond that point was much less as shown under.

(Number of commercial vehicles)

Traffic at	1993 census	1996 census
Km 21/0	2045	2557
Km 25/2	236	678

Further, 400 feet wide Outer Ring Road, which also connects NH 45 and passes through Thirumudivakkam Industrial Estate, would carry major portion of commercial vehicles. Besides, the main roads inside the Industrial Estate which would receive traffic from Thiruneermalai-Thirumudivakkam road were designed for a traffic of 5 MSA only.

The road work was taken up in April 1998 and completed in October 2000. Due to provision of higher thickness for the stretch from km 24/8 to km 28/0, there was avoidable extra expenditure of Rs 37.85 lakh to Government (Appendix XXXVIII).

The matter was referred to Government in March 2001. Government stated (August 2001) that the formula given in IRC Specifications provided for routine traffic growth and as additional traffic was anticipated due to industrial growth, the road beyond km 24/8 was also designed for 30 MSA. The contention of the Government was not tenable as the entire road from km 20/8 to km 28/0 was designed for the normal anticipated growth based on the traffic of 2045 commercial vehicles obtained at km 21/0 in 1993 and no weightage was given for the industrial growth. Further, both 1993 and 1996 traffic census revealed much less traffic at km 25/2 and the census of 1999 also revealed a declining trend both at km 21/0 (797 commercial vehicles) and at km 25/2 (321 commercial vehicles).