

Chapter 7: City Infrastructure Development: Roads and Flyovers

7.1 Introduction

As a part of upgradation of city infrastructure and in preparation for the Games, GNCTD had taken up 75 projects linked to city infrastructure improvement. Subsequently, 25 projects were stated to be directly linked to CWG for close monitoring.

Three projects were delinked¹ from CWG, and not taken up. In all, GNCTD undertook construction of 25 roads and bridges projects to improve infrastructure of the city during CWG 2010. Of these 25 projects, one project each was started in 2004, 2005 and 2006. Nine projects were started in first half of 2007 and four in the second half. Three projects began in first half of 2008 and four in the second half. Two projects were started as late as in 2009. Of these 25 projects, 17 were fully completed, and the remaining 8 were substantially completed and open to traffic, with physical completion status varying between 90 per cent and 99.5 per cent.

Audit selected six of these projects executed by PWD for detailed review viz. Raja Ram Kohli Marg Flyover, Ghazipur Flyover, Barapulla Elevated Road, UP Link Road, Corridor improvement on Road no.56 (Inter State Bus Terminal (ISBT)-Anand Vihar) and Ring Road Bypass. These six projects involved a total sanctioned amount of ₹ 2160 crore.

Table 7.1 – Road and flyover projects selected for detailed audit

(₹ in crore)

Name of project	Contractor	Estimated cost	Tendered amount	Date of award	Stipulated date of completion	Payment made as of Oct 2011
RR Kohli Marg Flyover	Afcons	146.40	214.57	Mar 07	Apr 09	258.26
Ghazipur Flyover	Afcons	173.36	199.79	Apr 08	Apr 10	175.79
Barapulla Elevated Road	DSC	352.40	433.71	Aug 08	Mar 10	451.35
UP Link Road	DSC	177.80	265.04	Sep 08	Apr 10	209.00
Road No. 56-Anand Vihar ISBT	Valecha	97.60	140.53	Nov 08	May 10	193.76
Ring Road Bye pass	Simplex	330.20	409.45	Dec 08 Jan 09	June 10 July 10	157.64 127.49

¹ Elevated East West Corridor, BSZ Marg Flyover, and Shastri Park Tunnel Corridor

Project Timelines: Most of the projects were awarded in 2008, with the CWG just two years away. The dates by which various important milestones were to be met for the six projects examined by Audit are tabulated below:

Table 7.2: Important Milestones for selected Road/ Flyover Projects

Name of Project	Date of Feasibility	Date of AA/ES	Date of approval of DUAC	Date of NIT	Date of award of work	Stipulated date of completion	Status as of Oct. 2011
RR Kohli Marg Flyover	Sep 05	Jul 06	Oct 06	Feb 07	Mar 07	Apr 09	Completed
Ghazipur Flyover	Aug 04	Apr 08	Jul 07	Dec 07	Apr 08	Apr 10	Flyover completed but formal completion is yet to be recorded
Elevated Road over Barapulla Nalla	June 08	Aug 08	--	Jul 08	Aug 2008	Mar 10	Connectivities under progress
UP Link Road	Mar 07	May 08	Dec 07	Jul 08	Sep 08	Apr 10	Completed
Road No.56-Anand Vihar ISBT	Sep 04	Jun 08	Jan 08	Aug 08	Nov 2008	May 10	Flyover completed but formal completion is yet to be recorded
Ring Road Bye pass	--	May 08	Sep 07	Jul 08 Sep 08	Dec 08 Jan 09	Jun 10 Jul 10	Completed

7.2 Adoption of contractor's profit and overhead charges of 37.5 per cent for bridge/ flyover projects

All the six PWD projects adopted contractor's profit and overhead charges (CPOH) of 37.5 per cent² for the bridge/flyover components (which represented the bulk of the work involved). This is in contrast to CPOH of 15 per cent (raised from 10 per cent in December 2007/April 2008³) stipulated by CPWD⁴.

² 25 per cent as overhead charges, and 10 per cent profit thereon; this works out to an overall 37.5 per cent

³ The increase was communicated by DG, CPWD in December 2007, but approved by MoUD only in April 2008.

⁴ CPWD's manuals, contract clauses and other terms and conditions/ circulars are generally

The justification adduced by PWD, GNCTD for adopting this percentage of 37.5 *per cent* (as opposed to 10/15 *per cent* adopted by CPWD) is that this CPOH rate was based on the “Standard Data Book for Analysis of Rates” issued by the Ministry of Road Transport and Highways (MoRTH). The foreword to this data book indicates that it is being adopted by various agencies for projects other than National Highways (which is the primary purpose of this data book). The estimates for these projects were prepared using the data elements indicated in the data book.

Audit observed that the basic approach for the preparation of the MoRTH data book⁵ highlights common elements of overhead charges for both road and bridge works, but specifies different rates for CPOH (varying from 18.8 *per cent* to 43 *per cent*) for different categories of road and bridge works. However, the MoRTH data book and the CPOH rates (indicated in the data book) have not been formally adopted by GNCTD⁶. Despite this, PWD, GNCTD have adopted the CPOH rate of 37.5 *per cent* (as per the MoRTH data book), which is substantially higher than the CPOH rate of 15 *per cent* stipulated by CPWD. This resulted in increasing the justified cost, worked out by the department after opening of the financial bids, by ₹ 352.47 crore.

PWD stated that CPOH at the rate of 37.5 *per cent* was adopted in conformity of the provisions of MoRTH Data Book. The reasons behind 25 *per cent* OH and 10 *per cent* CP as per MoRTH specification for bridges and flyovers items was that many smaller items which are incidental to bigger items such as laps and chairs in steel reinforcement, barricading, load testing of piles, establishment of laboratory with technical persons at site etc. involved in execution are not measured and paid separately. Reply is not acceptable as these items are also incidental of main items in DSR also. DSR also allows 5 *per cent* in name of waste in steel reinforcement. Moreover, in all these 6 contracts PWD included separate items for barricading and load testing in BOQ and paid separately also. While in ten states PWD Departments are adopting the MoRTH data book for the purposes of estimation of road and bridge work, in all these states the overhead and profit rates were state⁷ specific.

Further, Delhi Metro Rail Corporation (DMRC), which routinely constructs elevated viaducts, similar to flyovers, does not use the MoRTH data book for

adopted by PWD, GNCTD.

⁵ Indicated in the data book itself

⁶ It is not clear when PWD, GNCTD commenced using these higher CPOH rates.

⁷ (i) Orissa (10%), (ii) Haryana (10% CP + 21.5% OH), (iii) Tripura (15%), (iv) Chattisgarh (15%),

(v) Madhya Pradesh (10%), (vi) Goa (10% CP + 5%-15 % OH), (vii) Himachal Pradesh (10% CP + 10%-25 % OH), (viii) Rajasthan (10%), (ix) Assam (10% CP + 10%-20 % OH), (x) Karnataka (10% CP + 10 % OH)

its cost estimation. For any non-scheduled item of work executed by DMRC, whether following MoRTH specifications or otherwise, they apply a uniform fixed CPOH of 20 *per cent*.

It is also not clear whether the overhead components for constructing national highways (generally by NHAI) are applicable as such to the bridge and flyover projects in Delhi.

The critical importance of the CPOH rate is that once adopted for estimation purposes, the detailed estimates thus prepared constitute a baseline for potential bidders. The CPOH rate also forms an indirect input into the process of preparation of justified costs, where required, and the associated band of 5/10 *per cent* for assessing the reasonableness of rates for final award of the contract.

Thus, the use of the CPOH rate of 37.5 *per cent* for preparation of the estimates for the bridge/ flyover projects is inappropriate. GNCTD needs to carry out an in depth study of the actual elements of overhead involved (including the extent of equipment intensive construction methods actually in use for similar projects) and practices followed in other states for similar projects, before deciding on the appropriate CPOH rate for all such projects.

7.3 Irregularities in tendering procedure

7.3.1 Acceptance of bids quoted on papers other than tender documents

Rules and guidelines on form of the General Conditions of Contract (GCC), which are essentially part of NIT, stipulate that in case of item rate tenders, tenderers are expected to quote on the tender form. Any tender containing percentage below/above the rates quoted is liable to be rejected⁸. It was observed in Audit in three instances where bids were accepted by PWD despite being quoted on paper other than tender forms:

- PWD invited (July 2008) item rate tenders for work of construction of elevated road on Barapulla Nalla (in two packages) from the empanelled contractors/firms. Six bids were received for each package. The works were awarded to DSC Limited at ₹ 218.79 crore and ₹ 214.92 crore respectively for both the packages. It was however noticed that DSC became the lowest bidder not on the basis of his bid in the prescribed format of bid documents, but on the basis of separate letters quoting a lump sum amount stated to be found in envelopes containing financial bid,

⁸ Audit noted many instances e.g. Ghazipur flyover, where percentage discount was offered on tender form, but accepted in violation of this system.

- Similarly in case of UP Link Road project, where PWD invited (July 2008) item rate tenders, two bids were received, and work was awarded in September 2008 to DSC Limited at a cost of ₹ 265.04 crore. Again DSC became the lowest on the basis of separate letter quoting a lump sum amount stated to be found in envelop containing financial bid.

Award of work to DSC was irregular as:

- the letters were not part of the tender documents issued by the department but were stated to be found in envelopes containing financial bids,
- in the said letters, the firm had quoted the lump sum cost “after discount on all items”. It was PWD which converted the difference between the lump sum amount and amount worked out as per item wise bid, to a percentage discount to the quoted rate.

Taking cognisance of the letter which did not form part of the prescribed tender documents, and considering the lump sum cost quotation against the item rate tender was not in order and awarding of work to DSC limited was irregular. Further, Audit could not ascertain whether the said letters were submitted along with the bid documents or placed at a later stage. PWD stated that it was true that letters were not part of the tender document issued by the department but were found in envelope containing financial bid. The financial bid was evaluated in totality. Each and every word written any where in the financial bid or any letter enclosed with it could not be ignored. The reply is not acceptable as any document which was not part of prescribed tender document issued by the department is not to be considered.

7.3.2 Acceptance of bid despite over-writings/use of correction fluid

CPWD Manual prohibits the use of correction fluid anywhere in tender documents and, if used, such tender is liable for rejection. Audit observed that the bid documents of M/s Simplex Infrastructures Limited who was awarded the work of Ring Road bypass (Package II) had 12 cuttings/corrections, besides three cases of use of correction fluid for changing the figures, having an impact of increasing the bid amount by ₹ 6.23 crore.

Use of correction fluid in the tender document made it liable for rejection. In spite of these obvious shortcomings in the bid document, the department did not reject the bid.

In reply the department stated that in the tender for Package II, the tenderer M/s Simplex Infrastructures Limited have filled rates for approximately 113 items and used correcting fluid for correcting rate of three items only. The same has been duly taken cognizance of by Executive Engineer and recorded

on the corresponding pages at the time of opening of tender. 'Liable for rejection' does not mean mandatory/ summary rejection of the bid on this account and particularly when there is a difference of approximately ₹ 40 crore between the bid price of L1 & L2 on the estimated cost of ₹ 173 crore put to tender.

While there is no apparent monetary loss, but the sanctity of the bid process should be maintained and not vitiated.

7.3.3 Irregular invitation of percentage rate tender

Audit observed that tenders for RR Kohli Marg flyover were incorrectly invited (February 2007) as percentage rate tender, instead of item rate tender, as is required by the CPWD Works Manual.

Audit also noticed that though the tenders for the work were initially invited on item rate basis, yet it was subsequently changed to percentage rate tender without assigning any reason despite the fact that scheduled items based on DSR constituted only 2 *per cent* of the work.

Thus, invitation and acceptance of percentage rate tender was irregular.

GNCTD stated that there were no specific reasons recorded for initially inviting the tender on item rate basis and subsequently changing the same to percentage rate tender. Government further added that call of tenders on percentage basis is always better as tenderer cannot quote unbalanced rates during execution and try to avoid executing low rated items. The reply is not acceptable as the approving authority i.e. Chief Engineer approved for call of tenders on percentage rate without recording any reasons at the time of issue of corrigendum of item rate to percentage rate.

7.4 Unwarranted inclusion of items in Bill of Quantity (BOQ) of agreement

Audit observed that in six projects of PWD, the agencies had included separate items for providing temporary barricades and pile testing at the tendered cost of ₹ 11 crore and ₹ 11 crore respectively, against which, a payment of ₹ 14.69 crore had already been made.

Payment for both the items is inconsistent with MoRTH specifications⁹ for Road and Bridge Works, against which the project costs had been estimated and executed, which clearly states that traffic safety arrangements including erection and maintenance of barricades and pile testing would be considered as incidental to the works and would be contractor's responsibility.

⁹ Section 112

In reply the department stated that section 112.4 (Traffic Safety and Control) of MoRTH Specification for Road and Bridge works, is a general provision and does not mention height of barricade, sizes of members, its fixing arrangement to the ground, gap between each barricade, frequency of painting etc. The terms stipulated in the MoRTH specification are adequate in general for normal traffic on Highways & Road works in outskirts.

The reply is not acceptable because though it is true that MoRTH specification does not mention height of barricades, frequency of painting, etc. yet it is mentioned that barricades are not payable separately. If the department required specific type of barricades these could have been mentioned in special terms and conditions in the NIT without providing a line item in the BOQ.

On pile tests, the department stated that the initial load tests are carried out for checking adequacy of design load adopted for piles and in case of major deviation in actual pile load capacity, pile design is to be modified and initial load test is required to be conducted again. Thus, its quantity remained uncertain, and it is always advisable to keep separate item for initial load test and routine load test. Similarly, frequency of routine load tests and integrity test had to be defined, so that no dispute arises in case of any variation. MoRTH specifications do not stipulate the frequency of carrying out initial and routine load tests on piles.

The reply is not acceptable because clause 1118 of MoRTH specifications clearly mentions that routine and initial pile load tests shall not be measured for payment. Also, IS 2911 clearly prescribes both the minimum and maximum tests to be carried out. In case more number of tests beyond the maximum limit are required, the NIT can always provide for the same separately.

7.5 Non compliance with quality standards.

7.5.1 Usage of steel not conforming to standards in Barapulla elevated road

Audit noticed that out of 387 batches of steel consignment weighing 9048 MT, samples of 26 batches having the total batch weight of 642.01 MT and costing ₹ 5.79 crore were found, by the department, to be of weight lower than tolerance limit prescribed in IS 1786. These were, however, not rejected by the department leading to use of less than tolerance limit steel. Out of these 26 batches, samples of only four were sent to third party laboratories, which, on testing, found them to be conforming to standards. GNCTD stated that the tolerance limit for batches and individual samples were different. For payment for steel reinforcement the weight of individual sample of each batch was taken for the purpose of determining the unit mass of entire lot. This is not a quality test for steel reinforcement bars as its quality is measured by its tensile

strength and not by its weight. The reply is not acceptable because Audit has compared the batch tolerance limit mentioned in the steel mass register provided to it and found the tolerance limit to be lower than the prescribed. Further taking the weight of the steel reinforcement at the site is an integral part of the prescribed quality assurance process. However, it was seen that instead of the sub-standard steel being outrightly rejected, samples of these batches of steel which had failed in the basic tests, were sent to external labs for testing then again the same selected samples were subjected to third party tests.

7.5.2 Usage of steel not conforming to the standards in Ring Road Bypass

Another instance of non-conformity with standards was seen in the Ring Road bye-pass project where five batches of steel having total batch weight of 370.78 MT and costing ₹ 2.69 crore were found by the department to be of weight higher than tolerance limit prescribed in IS 1786. These were, however, not rejected by the department, leading to use of non-compliant steel.

GNCTD in reply stated that there could be human error in checking at site. Moreover, testing laboratory has better controlled conditions and therefore, results of the test laboratory are given more authenticity and reliability and accordingly are given precedence over results at site laboratory. As the laboratory test reports of all the steel samples were found in order, the steel reinforcement for the said lots were treated as acceptable. Reply is not acceptable as from the reply it appears that the prescribed quality assurance mechanism of on site weight checking was of no consequence, which is not a fact as it is an integral part of the quality assurance mechanism prescribed by the department itself. Moreover, the Section 26 of the CPWD Manual clearly provides that sample shall be taken and got tested by the engineer-in-charge as per the provision in this regard in the relevant BIS code. In case the test results indicate the steel arranged by the contractor does not conform to the BIS code, the same shall stand rejected.

7.5.3 Pile tests to confirm quality not carried out

Audit observed that routine tests of piles were not carried out during construction of the elevated road over Barapulla Nallah, in violation of MoRTH specifications and IS 2911-1985¹⁰.

As per IS 2911-1985, routine tests for pile are necessary primarily to determine the safe load on pile, and between one-half *per cent* to two *per cent* of the piles are required to be tested. This translates to a minimum of seven

¹⁰ Indian Standard Code of Practice for Design and construction of Pile Foundations

routine tests to be conducted in case of Barapulla Nallah. As not even a single routine test was carried out, Audit could not ascertain how the PWD authorities satisfied themselves that piles were executed as per the IS specifications.

PWD in November 2010 stated that these tests could not be undertaken due to shortage of time. However, GNCTD in December 2011 stated that routine test of piles were carried out. This reply could not be verified in audit as no test report was found enclosed alongwith the reply.

7.5.4 Unauthorized substitution of Portland Slag Cement with Ordinary Portland Cement

As per agreement slag cement was to be used in construction of elevated road over Barapulla Nallah. However, Audit noticed that Ordinary Portland Cement (OPC) was used in place of Portland Slag Cement without the approval of the competent authority. A total quantity of 16264 MT of OPC was used in place of slag cement. Slag cement and OPC have distinct properties and have distinct applications and uses. The use of slag cement in this project was a conscious decision by higher authorities. Substitution of slag cement with OPC without approval of competent authority has the potential of compromising the quality.

GNCTD stated that the progress of this work was being monitored by the Chief Engineer on a day-to-day basis and decisions were being taken then and there in the weekly review meetings due to urgency of this work. It was further stated that use of PPC in place of PSC was allowed by competent authority under emergent conditions of shortage of PSC in the market and as per codal provisions and therefore there is no question of compromising with the quality of work. The reply is not acceptable as NIT was approved by the Chief Engineer and as per the provisions of the CPWD Works Manual formal approval of the Chief Engineer was mandatory to substitute PSC with PPC before such substitution. Moreover, the approval of the Chief Engineer was not obtained even after one year of the commissioning of the Elevated Corridor.

7.6 Contract management

7.6.1 Adoption of revised price variation clause

Price variation in PWD is payable as per standard clauses¹¹ in General Conditions of Contract (GCC). Audit noticed that PWD incorporated a new clause 10CCA for price variation in all the six selected PWD projects. The standard price variation clauses of GCC stipulate that for each project, the proportion of key components of steel, cement, labour and material is computed based on the estimated usage of these items in the project, which

¹¹ 10C, 10CA, 10CC

varies from project to project. In contrast, the new clause introduced by PWD adopted constant percentages of use for all the components, viz, labour (22 per cent), steel (25 per cent), cement (15 per cent), fuel (5 per cent) and machinery and machine tools (18 per cent). Further, the CPWD manual does not prescribe any price variation payable on machinery and machine tools, though it was prescribed in this new price variation clause.

As the proportion of steel used in these projects was far higher than 25 per cent, and there was a downward trend in prices of steel during the construction period of four of these projects, the amount of recovery was lesser by ₹ 18.01 crore than that which would have become recoverable with the standard price variation clause.

Audit also noted that no financial or legal advice was taken by the Chief Engineer before incorporation of this new clause, as is required vide General Financial Rules (GFR) and CPWD manual.

PWD stated that the NIT approving authority could introduce additional terms and conditions in NIT to suit the exigencies of work and these would override the corresponding standard clauses of various forms.

Reply is not acceptable as only a formal, well thought out policy decision at the department level after taking financial and legal advice for amending critical conditions of the GCC can ensure that the interests of the Government are protected. This cannot be left to the discretion of individual NIT approving authority on a contract to contract basis.

7.6.2 Incorrect measurement of underweight steel resulting in excess payment of ₹0.35 crore

Audit observed that 5184.26 MT of reinforcement steel bars were found underweight by 48.842 MT in terms of standard unit weight in Ring Road Bypass project. However, while converting the length into weight for payment purpose, in violation of section 5.3.4 of CPWD specification which stipulates that if actual unit weight of reinforcement bars is less than the standard unit weight but within variation, then weight of reinforcement shall be calculated on the basis of actual unit weight. The actual unit weight has been ignored and payment was made for standard unit weight of 5233.102 MT, resulting in excess payment of ₹ 34.63 lakh. PWD stated that the provision of the agreement provides that the records for actual sectional weight of each dia of bar for every lot of steel brought to the site shall be maintained as per specification. This provision mentions about maintenance of record as per CPWD specification and not for payment. The reply is not acceptable as the payment to the contractor for reinforcement steel bar should have been made according to the CPWD specifications.

7.6.3 Extra expenditure of ₹1.13 crore due to post tender change

In the project of construction of grade separator at ISBT Anand Vihar crossing of Road No. 56, PWD substituted the items of work, construction of three pipe culverts, with the item for executing the same using a different technology (trenchless digging). This entailed an additional expenditure of ₹ 1.13 crore. GNCTD stated that substitution was done because it was a busy road and it was difficult to cut open the road without disrupting the traffic and this situation could not be foreseen at the time of preparation of Detailed Estimates/NIT. The reply is not tenable as the traffic on this corridor was a well known fact and it should have been taken into consideration at the time of preparing detailed estimates. Had the department included the item of laying of pipe by trenchless method in the detailed estimates/NIT/ tenders competitive rates could have been quoted by the bidders and government could have got the advantage of fair market competition.

7.7 Loss due to incorrect estimations

7.7.1 Avoidable expenditure of ₹ 3.66 crore due to inaccurate estimation

- Audit observed that in RR Kohli project, the requirement of mastic asphalt had been grossly underestimated, with an estimated quantity of 6200 square meter of mastic asphalt in agreement, while the actual quantity executed was 56724 sqm. an increase in quantity by 815 *per cent*.

The contractor was, therefore, paid for mastic asphalt as per market rate of ₹ 572 per Sqm. against the contract rate of ₹ 296, in keeping with Schedule F of the contract, which states that contractor was eligible for payment at market rates for items which had been executed beyond 30 *per cent* of the agreement quantity. This has resulted in avoidable expenditure of ₹ 1.34 crore for payment for the extra quantity of 48664 square meter of mastic asphalt at market rates.

Similarly in the same project, the quantity of reinforcement steel increased by 197 *per cent* and department had to pay ₹ 1.94 crore extra to the agency on account of the difference in agreement rates and market rates.

GNCTD stated that initially the project was conceived to be constructed partly on stilt and partly with a retaining wall and estimates were prepared accordingly. But the Yamuna Standing Committee approved the proposal for construction on stilts. In addition, the original scope of work had the provision of steel column and steel pier cap but later on it was changed to RCC. Due to these reasons, deviation in estimated quantities of mastic asphalt and reinforcement steel took place. Further, as per agreement escalation for steel is not payable for the quantity where market rate is

payable. Accordingly, no escalation was paid for such quantity. Had the division added escalation to the agreement rate the total rate works out to ₹ 43.17 per kg which is more than the market rates paid. The reply is not acceptable as all these factors affecting construction should have been taken care of at the time of preparation of detailed estimate. Secondly, payment under clause 10 CCA of the agreement depends upon the quantity of the steel consumed in the particular month and the difference in the cost index in that particular month. Further in working out the total rate of ₹ 43.17 per kg, the department has applied the escalated rate of steel upto the actual date of completion without restricting it to the stipulated date of completion. Also it did not consider the cost index of the month in which the steel was actually consumed.

- Audit observed that in the work of the Gazipur Project the quantities of mastic asphalt were grossly underestimated in the detailed estimates prepared by the consultant. The actual executed quantity was upto 311 *per cent* more than the estimated quantity for which department had to pay ₹ 0.38 crore extra to the agency on account of the difference in agreement rates and market rates.

PWD stated that in pre-bid meeting, provision for RCC wearing course to be laid in underpass had been deleted from the scope of work and it was decided that type of wearing course in underpass would be decided at the time of execution. Later on bituminous wearing course was laid which resulted in excess quantity of mastic. Reply is not acceptable as in a project of such magnitude there has to be prior planning for wearing course of underpass.

7.7.2 Loss of ₹3.55 crore due to incorrect estimation

Audit observed that estimation for quantities prepared by the Tandon Consultant Pvt. Ltd. in Package-II of work relating to Elevated Road over Barapulla Nallah was not very accurate with large deviations. As a result, based on the actual executed quantities of material used, the inter-se ranking of L1 and L2 bidders changed with the bid of L2 bidder now lower by ₹ 3.55 crore than L1.

Greater accuracy in estimate preparation would have led to the work being awarded to a different contractor, and a sum of ₹ 3.55 crore could have been saved. The department did not invoke the relevant penalty clause against the consultant for his error in estimate preparation.

Department stated that at a later stage a circulation plan for movement of traffic and pedestrians around the Jawahar Lal Nehru Stadium was formulated in consultation with the MCD and CPWD, who were the other two agencies working in the same area. This circulation plan was approved by UTTIPEC

and it has increased the length of the elevated road by about 380 meters. In addition, a retaining wall was also constructed to accommodate the parking area developed by MCD. Further at the behest of Delhi Traffic Police two connectivities to this road were also taken up for construction under the same agreement. These extra items had resulted in deviation in quantities which was not due to error in the estimates but cropped up during the course of execution which could not have been anticipated at the time of framing the estimates/award of tender. The reply is not acceptable as all these aspects should have been considered at the time of planning of this elevated road with proper co-ordination with the other agencies.

7.8 Execution of works without tendering

Audit noticed that two major works were executed as deviation to ongoing works, i.e., without call of fresh tenders. The two cases are discussed in succeeding paragraphs.

7.8.1 Work costing ₹ 51 crore without tendering

During the construction of Barapulla elevated road, the Delhi Police requested PWD to provide proper connectivity of this road with Lala Lajpat Rai Marg so as to provide uninterrupted dedicated lane for athletes to move from CWG Village to all sports venues during CWG-2010. The PWD proposed to GNCTD to construct this connectivity through main contractor without calling the tenders so that work could be completed before CWG-2010. GNCTD accorded administrative approval and expenditure sanction for ₹ 51 crore for this work in July 2009. This proposal was approved by GNCTD keeping in view the fast approaching CWG 2010 but connectivities were not completed in time for the Games and the work was ongoing as of November 2011.

Despite having got the approval of GNCTD the PWD had not taken required initiatives to ensure completion of the work before CWG-2010. Even the main contractor was not officially informed regarding completion of the said connectivity before CWG. PWD did not obtain the consent of the contractor to complete the work as deviation without asking for extra time and at the time of submitting the proposal to get the work done through deviations. There was no plan/mechanism with the PWD to get the work completed before CWG-2010 which resulted in irregular award of work of ₹ 51 crore.

In their reply the PWD stated that due to shortage of time and resources the competent authority had decided to get the connectivities completed through same contract as deviation in the quantity of work and asking the ongoing contractor to take up the work as deviation in ongoing project contract was as per delegated financial powers and codal requirements prescribed in CPWD works manual. The reply is not acceptable as taking up the construction of connectivities as deviation in ongoing contract these were lying incomplete as on December 2011 due to lack of initiative by the department.

7.8.2 Work costing ₹11.63 crore undertaken without tendering

GNCTD conveyed the approval for ₹ 11.63 crore for widening of the existing bridge on Trunk Drain No. 2 at the T Junction of Road No. 56-71 and bridge on Road No. 56-58A, and widening of Road No. 56 from 6 lane to 8 lane in front of ISBT Anand Vihar to provide smooth and signal free traffic on Road No. 56. The Executive Engineer decided to get work executed (without call of open tenders and without the approval of competent authority), by Valecha Constructions, the contractor who was executing the ongoing work for “Corridor Improvement of Road No 56-ISBT Anand Vihar and allied works”, so that the work could be completed before the Games. The work was in progress as of August 2011.

Audit maintains that widening of the bridges was not a part of work already being executed in that area and thus cannot be termed as deviation in any way. Hence, award of work to M/s Valecha Engineers Limited without call of open tenders was unauthorised.

GNCTD stated that it was intimated to the Principal Secretary, PWD that these works could be completed before CWG 2010 if done as deviation under ongoing contract there was likelihood that if fresh tenders had been called there would have been no response from eligible agencies for such work or PWD would have received much higher rate than the quoted rates of ongoing contract. It was further stated that these works were only extension of ongoing main work and not completely new work at a different location. Reply is not acceptable because these are mere presumptions and Administrative Approval and Expenditure Sanction was issued with the condition that PWD should complete all the codal formalities as per General Financial Rules and CPWD works manual while awarding the work. Moreover, the work could not be completed before CWG 2010 even as deviation in the ongoing contract.

7.9 Infructuous expenditure of ₹ 8.65 crore on FOBs

The work for construction of two arch foot over bridges (FOBs) was awarded to P&R Infra Projects Limited at a tendered cost of ₹ 10.35 crore to facilitate the public to reach JLN Stadium during CWG. The design of the FOB was of a suspension type, and not the ordinary pillar supported structure, and was being attempted for the first time by PWD, Delhi. Given the limited amount of time available for the Games, it may have been better for PWD to stick to the tried and tested method of FOB construction. However, PWD decided to use an imported suspension system (Macalloy make) in spite of the fact that a suspension bridge with a similar suspension system had collapsed in Glasgow in 2008. Instead of awarding the design consultancy work to a specialized agency having experience in the related field, the work was awarded as extra item to the consultant for the main work (M/s Tandon Consultancy).

The deck of one of the FOBs collapsed during construction, while concrete was being laid. After this incident no efforts were made to construct the deck of second FOB or reconstruct the deck of ill fated FOB.



Collapsed FOB near JLN Stadium

In the absence of FOBs to provide approach to Jawahar Lal Nehru Stadium (JLNS), PWD arranged for construction of temporary FOB by the Indian Army.

The Dogra Committee, set up by GNCTD to enquire into the reasons for the accident, has pointed out that the design of the joint in sufficient detail was not provided by the design consultant. The contractor devised the procedure on his own and did not obtain necessary approval for the same. Deviation from the correct design led to failure of the joint and collapse of the deck slab.

As drawings and design prepared by the consultant were subject to the approval of the department, failure of the PWD in ensuring correct methodology and design for the FOB and to identify a consultant competent to attend to this work resulted in infructuous expenditure of ₹ 8.65 crore, which has already been paid to the contractor and consultant.

In response, PWD stated that the completion of the work had only been postponed and not altogether shelved, and as such, the expenditure could not be termed as infructuous. The reply is not tenable as the main purpose of these bridges to be ultimately used by pedestrians for approaching the JLN Stadium during the Games was not fulfilled. The work has not been restarted and in any case the FOBs have no legacy value.

7.10 Extra avoidable expenditure of ₹ 0.73 crore

Specifications for road and bridge works, Ministry of Shipping, Road Transport and Highways provide that for high traffic density wearing course

comprising of 40 mm bituminous concrete overlaid with 25 mm thick bituminous mastic layer can be adopted.

However, in Ghazipur project the PWD had provided a layer of 50 mm bituminous concrete in place of prescribed 40 mm layer of bituminous concrete and 25 mm thick bituminous mastic as wearing coat on the road of Gazipur Flyover Project. Thus, over designing of wearing coat of the road had resulted in extra expenditure of ₹ 73.24 lakh on excessive bituminous concrete.

GNCTD stated that the richer specifications were adopted because this flyover would be the part of proposed Delhi Meerut Expressway and therefore had to be designed for 120 Km/hr., instead of 60-80 Km/hr being adopted for urban road. PWD further stated that 50 mm DBC was approved by MoRTH itself in the technical specifications while according the sanction for two other works for widening of NH-24 from 4 lanes to 8 lanes adjacent to this flyover. Thus, providing 50 mm thick Dense Bituminous Concrete (DBC) was the technical requirement. It was also added that said specification of MoRTH are for deck of bridge and flyover only. Reply is not acceptable as neither during conduct of feasibility study nor while granting approval to the proposal by GNCTD for this project was there any mention of such a corridor. Secondly this being an urban road traffic speed within the city of Delhi is restricted to 60 Km/hr. PWD itself, on eight flyovers constructed alongwith this flyover during the same period, has provided wearing course of 40 mm DBC as wearing coat on deck as well as on its approaches. Further in the said technical specifications for widening of NH-24 in two other works the wearing coat was designed with 50 mm DBC without the provision of mastic asphalt whereas the wearing coat on this flyover and its approaches was provided with 50 mm DBC overlaid with 25 mm mastic asphalt. Thus, it cannot be compared with widening of NH-24.

7.11 Unauthorised execution of work

Section 23.3.2 of CPWD Works Manual provides that no extra/substituted item should be executed or approved without the prior concurrence of the authority who accorded the Technical Sanction. Audit noticed that 12 extra items amounting to ₹ 5.90 crore were executed in work of Barapulla Project and Ring Road Bypass project without the approval of the competent authority. Though these extra items were got executed on road and bridges which have been opened for public use prior to October 2010 and completion certificate of RR bypass had already been recorded but no approval of the competent authority was obtained even after execution of these works and they were lying unapproved as on August 2011.

In the absence of the concurrence of the competent authority, the necessity of these items is uncertain. GNCTD stated that a few extra/substituted items were executed during the course of work but these were executed in the interest of work and as per provisions of the agreement. Though no formal approval of the competent authority is available on record prior to execution of such items but the tacit approval was always there since the progress of work was being monitored by the Chief Engineer on almost day-to-day basis during the course of execution. Further, in principal approval of competent authority for various extra items were deemed to have been taken during his regular site visits and accordingly execution of these items was allowed at site. Over and above, there was enough pressure on field engineers to get the work commissioned and operationalised before CWG and they were having no time to initiate in writing the proposal for obtaining in-principle approval of such items. Prestige of the nation was at stake and commissioning of the project was the only motive. The reply is not convincing as the approval of competent authority to these items has not been obtained even after one year of completion of the these works.

7.12 Other irregular payments

7.12.1 Excess payment of ₹ 1.43 crore due to violation of agreement terms

Schedule-F of the Agreement defines the percentage to be added on cost of materials and labour to cover all overheads and profit in the cost for determining the market rates of an item.

As per Schedule-F of agreements of Gazipur Project and RR Kohli Project, the CPOH was to be added at the rate of only 10 *per cent* for fixing the market rate for deviated and extra items. However, Audit noticed that the department allowed CPOH at the rate of 37.5 *per cent* and 15 *per cent* in determining the market rates of the deviated and substituted items.

Allowing the CPOH at a rate higher than that prescribed in the agreement has resulted in excess payment of ₹ 1.43 crore to the contractor for eleven items.

In their reply the GNCTD stated that after being pointed out by Audit the rates for the items which are available in DSR have now been analysed on the basis of DAR by allowing ten *per cent* CPOH and the market rates of certain items viz., Mastic asphalt, RR stone pitching etc., works out to be more than what has been sanctioned by the department based on the MoRTH Data book allowing ten *per cent* CP and twenty five *per cent* OH. Hence rates of these items have not been modified. Further, necessary recoveries are being made from the payments due to the contractors as pointed out by Audit. Reply is not acceptable as the contract permits only ten *per cent* OH on all items irrespective of their being in DSR or MoRTH.

7.12.2 Excess payment of ₹ 0.36 crore due to higher CPOH

Audit noticed that in “ISBT Anand Vihar Project, the department had not disclosed the percentage of overhead in Schedule-F of the agreement. However, the contractor’s profit was decided to be added at the rate of 10 *per cent*. It was further noticed that while determining the market rates for payment of extra items/ deviated items OH at the rate of 25 *per cent* and contractor’s profit at the rate of 10 *per cent* was added by the department. Whereas as per extant orders of Director General of Works, CPWD, CPOH at the rate of 15 *per cent* was to be added. Addition of OH at higher rate resulted in over payment of ₹ 0.36 crore. In their reply PWD stated that as stipulated in Clause 12 of the contract and provisions of CPWD Works Manual, the Analysis of Rate for determining market rate of deviated items shall be same as adopted in preparing justification. The extra items which are not covered by CPWD specifications and Delhi Schedule of Rates are executed as per MoRTH specification and their rates were determined in accordance with MoRTH Standard Data Book.

The reply is not acceptable as the General Conditions of the contract clearly stipulate that CPOH will be fixed @15 *per cent* for determining the market rates for all items.

7.13 Engagement of consultants in PWD

For design and implementation of flyover projects, PWD appointed consultants for feasibility study of the projects, preparation of structural designs/ drawings/ estimates/ justified amount statements, proof consultants for checking of the proposed designs and drawings. Audit noticed that:

- the works were awarded to the contractors for execution following the norms prescribed in CPWD Manual and specifications of MORTH and relevant BIS codes. Ensuring quality and specifications for the works was the responsibility of the contractors executing the works and the officers (Engineer-in-Charge, Project Manager, Chief Engineer and Engineer-in-Chief) supervising it. In addition, the consultants entrusted with the designs of the projects were also tasked with ensuring execution of the works as per the designs/drawings and specifications. However, the department had further engaged Third Party Quality Assurance (TPQA) for independent assessment of the quality and specification of the works at a total tendered cost of ₹ 14.74 crore. Although the TPQA is to be selected from among the short listed panel for such job, the department did not have any specified policy and qualifying criteria for selection of the TPQA. TPQA consultants were engaged in all the projects examined making TPQA consultancy more a norm of CPWD rather than an exception,

adding 1 to 2 *per cent* to the cost of the project. It was also observed that the quality assurance consultants are actually not independent from execution since TPQA were engaged by the Executive Engineers directly in charge of the execution and the test/investigation reports were also submitted to them. To ensure that the third party quality assurance agency is truly independent of both the executing agency, and the contractor, the TPQA should be engaged and monitored at a level higher than the Executive Engineer. Further, PWD should strengthen and streamline its systems for quality assurance and come out with clear guidelines on engagement of TPQA providing agencies. No specific reply was submitted by the GNCTD on this issue.

- as per section 53.2 of CPWD Manual, the ‘quality assurance plan’ has to be a part of the tender documents. However, it was noticed that in all projects the work of TPQA was awarded after two to ten months after the works commenced which not only defeated the purpose of TPQA but also resulted in non-inclusion of Quality Assurance Plan in the tender documents.
- the consultancy agreements provided for performance guarantee and performance security at five *per cent* of the tendered cost for the performance of the contract. In audit it was noted that design consultancy agreements provide a clause to deal with the post contract variations in assessed quantities if any. The agreement did not explicitly state the accountability for lack of accuracy on designs and estimation. Audit noticed gross variations in quantities of two major items viz. reinforcement work and steel liner for pile ranging between 28 and 100 *per cent* in six projects involving impact on the cost of the projects and extra payment to the contractor. Since the projects are consultant driven, in audit’s view, the defect liability for the consultant should have been strengthened with specific provision for accountability for timely completion of the project, as per specified designs and also within the estimated cost.

GNCTD stated that there have been changes in structural system from the conceptual stage to preliminary design stage and then to final stage of design due to site constraints and therefore quantities in few cases varied by more than 20 *per cent* but they had valid reasons. Reply is not acceptable as detailed estimates were to be prepared by the consultant after considering all these aspects.