RAWALPINDI-ISLAMABAD METRO BUS PROJECT

INSPECTION REPORT

BY

QUALITY INSPECTION TEAM, NESPAK

1. **General**

The NESPAK Management through order no. 099/1201/AA/336M/15530-43 dated March 18, 2014 has constituted the following Quality Inspection Team (QIT) to review various construction related aspects on ongoing projects:

The Team Comprises of the following officers of NESPAK:

1.	Mr. Mahmood A. Sulehri General Manager/Head Contracts Division	Convener
2.	Mr. Haseeb A. Khawaja General Manager/CM Division	Member
3.	Mr. M.DawoodRana General Manager/ H&TE Division	Member
4.	Mr. Faisal Ali Principal Engineer/Power & Mechanical Division	Member
5.	Mr. Abdul Basit Advisor	Member
6.	Mr. Ahsan G. Hasan Advisor	Member
7.	Mr. M. Sajid Advisor	Member

Furthermore, the Convener may co-opt any other member from within NESPAK keeping in view the specific requirement of any project.

QIT is to visit projects during different stages of construction to ensure that all the construction aspects such as specifications, drawings, quality control procedures etc. are being adhered to and to submit reports to the Managing Director after every visit to the site(s).

2. **Project Visiting Team**

The Quality Inspection Team (QIT) in its first meeting held on March 24, 2014 decided that minimum of three (03) members of QIT should visit identified project sites and besides addressing the quality control requirements on technical aspects, due consideration should also be given to the various aspects of contracts administration like delays, schedule, claims, variations etc. during the different stages of project execution.

For the inspection of "Rawalpindi-Islamabad Metro Bus Project", a group of following members visited the Project site from May 27 to May 29, 2014:

Mr. Haseeb A. Khawaja	Member
Mr. Abdul Basit	Member
Mr. Ahsan G. Hasan	Member
Mr.Syed Mohammad Nadeem	Co-opted
Principal Engr. (M & QC Div.)	Member

3. **Project Description**

The team reached Project Office, Rawalpindi on May 27, 2014 before noon. The Project Manager (PM), Mr. Danish Raza received the team and gave a detailed introduction of the Project. According to him, the salient features of the project are as follows:

Client: Rawalpindi Development Authority (RDA)

Cost: Rs. 44.00 Billion

Start point: Hotel Flashman, Sadar, Rawalpindi

Finish Point: Pak Secretariat, Islamabad

Route: In Rawalpindi, on Murree Road from Hotel Flashman up to IJP Road near Faizabad; in Islamabad, from IJP Road to Pak. Secretariat along 9th. Avenue and Jinnah Avenue

Start Date: April & May, 2014

Finish Date: December, 2014

Total Length: 24.80 Km

Number of Packages: 8 (3 in Rawalpindi, 5 in Islamabad)

Number of Bus Stations: 24 (10 in Rawalpindi & 14 in Islamabad)

The PM also informed that the project in Rawalpindi area is elevated whereas in Islamabad, it is on ground. In Islamabad, to make the project environmental friendly and disturbing the green area minimum, the road in most of the areas runs below the natural terrain in the form of a trench.

The elevated portion of the project comprises of Y-shape reinforced concrete columns supporting the two separate single cell precast prestressed concrete box girders jointed with cast in place concrete deck slab making the total width of superstructure equal to 9.20 meters. The reinforced columns are almost square in shape whereas the Y-legs are supporting a trapezoidal shaped transom. Generally, the girders are continuous over two piers and have an expansion joint over the third pier. However at bus stations where the total width of the superstructure is 18.20 meters, prestressed precast inverted T- girders will be used.

In Islamabad area where the MBS is at ground level, the road in most of the part is in a concrete trench below ground except at the junction of Jinnah Avenue and 9th. Avenue where it is elevated and parallel to existing flyover.

The piers are supported on 1.20 meter piles of different lengths as per load and subsoil requirements through pile caps. As the generally subsoil strata is clayey up to 30 to 35 meters below ground level, therefore, the piles are being bored through Auger Bucket Boring method. However, the Reverse Rotary Boring method is also being used where the loose strata or underground water is encountered at shallow depths. Generally, the pile lengths vary from 35 to 45 meters.

The detailed description of works, physical progress, schedule and quality control of each package is described in the respective packages.

4. **Site Staff**

The list of site staff is attached as Annex-2. The PM categorically pointed out the acute shortage of the Site Supervisory Staff and the transport for the Project although the work is in progress 24 hours/ 7 days a week.. This has overloaded the present staff and is making them difficult to check the Contractor's staff properly.

The details of site staff of each package are appended in Annexure-1.

5. Physical Progress

The progress of packages of Rawalpindi area is relatively better than those of Islamabad due to earlier start.

Meetings with the Client and the Contractors are conducted on weekly basis to monitor the progress and other issues. If and when required, the meetings are also held to resolve day to day issues about the design or construction.

The details of physical progress of each package are appended in Annexure-1.

6. Quality Control

The inspection team handed over the list of the documents and test reports to each Resident Engineer to provide them for their record.

The Material Engineers are from NESPAK. The quality control record is being maintained and the testing of reinforcing steel is being carried out at University of Engineering and Technology (UET), Taxila but no testing has been carried out by third party laboratories for which they were advised to do so. Routine tests on concrete are being carried out in the site laboratories.

The details of material test results of each package are appended in Annexure-1.

7. Schedule

The Bar Chart Schedules have been prepared with start date of 15-04-2014 and completion date by 15-12-2014 for Rawalpindi Packages whereas with different start dates but same completion date of 15-12-2014 for Islamabad Packages.

The details of schedule of each package are appended in Annexure-1.

8. **Observations by QIT**

(i) The overall progress of construction work of packages of Rawalpindi is better than that of Islamabad packages due the earlier start. However due to land acquisition issues for the bus stations and other area of the rout in Rawalpindi, the progress may be hampered.

(ii) The overall quality of work is satisfactory especially in the prevailing circumstances of acute shortage of supervisory staff and transport.

(iii) The position of NESPAK is as of “Engineer’s Representative (ER)” whereas the “Engineer” is the Client’s Director Engineering.

(iv) The variations in works are being finalized by the Engineer.

(v) Almost on all packages, the coarse and fine aggregates are from the same source i.e. Margalla and Lawrencepur respectively whereas the reinforcing steel and cement are from different sources.

(vi) The job concrete mix design is more or less same for all packages due to materials from the same source.

(vii) Concrete cylinders for 7 and 28 day’s compressive strength are regularly being filled and tested on the on-site material testing laboratories and their results are satisfactory.

(viii) It was noticed that the request for concrete from the pouring site to the concrete batching plant operator was being conveyed telephonically i.e. no official copy of the request slip from the site staff was being forwarded to him. It was revealed in RE’s offices that copies of such requests were not being distributed to their respective recipients. This is not a good practice and the REs.

were advised to follow the Sequence of Procedures (SOP). However, the Despatch Slip is with the driver of the transit mixer.

(ix) The concrete is transported through transit mixers from the batching plants to the site and in most of the cases, especially in long piers and transoms, is being poured through mobile concrete pumps. The concrete is vibrated internally through the portable poker vibrator whereas the externally it is vibrated through hammering the steel formwork with rubber hammer.

(x) The reinforcing steel from each lot of supply to site is being tested at UET Taxila; however it was advised by the inspection team to get it tested from other labs also. Interestingly it was noticed that the yield strength and breaking strength of steel samples was appreciably higher than the standard minimum requirements from different sources.

(xi) It was informed that no visits to steel rolling mills have been made by the material engineer to check the quality of steel manufacturing process. The Resident Engineers (Res.) were advised to do so in spite of the fact they were short in number.

(xii) The admixtures are regularly being added to concrete to achieve the workability and strength; however retarders are not being used due to short haulage distances to site from the concrete batching plants.

(xiii) Four numbers of piles for Pile Load Testing have been cast for Rawalpindi Packages near Hotel Flashman, Committee Chowk, Nawaz Sharif Park and at Faiazabad. Based on the test results, the pile lengths of Package RWP-1 were set longer than the rest of the packages.

(xiv) No Site Instruction/field Books are being maintained at site; all necessary instructions are exchanged through official letters with copies to all concerned.

(xv) The Construction Management and Quality Plans and other Quality Assurance are not being prepared and maintained. Other issues related to Quality Control are discussed in Annexure- .

(xvi) It was observed that no safety measures against any mishap were being taken. None of the staff members, both from the Consultant or the Contractor side, was wearing any safety helmet or shoes. The dangerous areas such as deep excavations were not cordoned off with warning tapes etc. This is a dangerous and irresponsible behaviour which should be addressed immediately.

(xvii) Design related issues are being resolved efficiently with the help of the designers.

(xviii) Strangely, the boring of holes for geotechnical investigations was being carried out even after the pile caps or piers have been built.

9. **RAWALPINDI PACKAGES**

(i) **Package RWP-I**

a) Package Description

Start point: Hotel Flashman, Sadar, Rawalpindi

Finish Point: Committee Chowk, Rawalpindi

Route: On Murree Road

Start Date: April, 2014

Finish Date: December, 2014

Total Length: 24.80 Km

Number of Bus Stations: 4

Supervision Consultant: NESPAK

Contractor: M/S ZKB Pvt. Ltd.

As described earlier, the whole project is elevated on piers. At its start point, it has a rotary structure for turning of buses and this structure will later be merged into the proposed car parking plaza. This rotary also has an access ramp for emergency vehicles such as ambulances and fire engines. In this segment, the piers are very tall (17-21m) in some locations such as overhead crossing of

railways at Marrir Chowk, Nullah Lai and underpass at Committee Chowk. Due to too much height of column and flowing water of nullah Lai, the shape of column up to high flood level, was changed into wall pier.

b) Physical Progress

The work is in full swing and the overall progress of the project is at par with schedule. Some of the piers are complete up to transom level. Scaffolding for in-situ concreting of box girder of the rotary structure was in progress.

Two number concrete batching plants of capacity of one cubic meter (cu. m) each have been erected at Liaqat Bagh Area. The casting yard for the girders is located at Shakkar Parian in Islamabad where an independent batching plant has been established.

c) Quality Control

- The cylinders for testing of concrete strength are being filled regularly and being tested at laboratory for 7 days and 28 days strength.
- The slump tests of concrete are not being carried out at site due to closely located batching plant.
- The batching plants have been properly calibrated.
- The tests indicate that the strength of concrete and of the reinforcement is above the required one.

d) Observations by QIT

- The overall quality of concrete work is satisfactory; no honey combing of concrete was observed.
- Curing of concrete is being carried out with water but at some locations, the hessian cloth around the piers for curing was missing or dried up.
- The construction joint preparation of pier columns, especially at edges, was not properly done.

- It was informed that concrete load was rejected at site due to slump issue and the batch was sent back for correction but its record was not maintained.
- The Contractor was rendering the surface of the piers side by side of their construction.
- Tender drawings were found mixed with the construction drawings.

(ii) **Package RWP-II**

a) Package Description

Start point: Committee Chowk, Rawalpindi

Finish Point: Sixth Road, Rawalpindi

Start Date: April, 2014

Route: On Murree Road

Finish Date: December, 2014

Total Length: 24.80 Km

Number of Bus Stations: 3

Supervision Consultant: NESPAK

Contractor: M/S NLC Pvt. Ltd.

As described earlier, the whole project is elevated on piers. The area of this package quite congested with lot of utilities. However, there is no special problem with design and construction. The RE had raised some design issues which were conveyed to the designer.

b) Physical Progress

The construction of this package is behind the schedule due to internal issues of the Contractor as stated, and the area being very congested and problem of shifting of utilities and land acquisition. The pouring of piers is in initial stages.

Two number concrete batching plants of capacity of one cubic meter (cu. m) each have been erected behind The Benazir Bhutto Shaheed Hospital. The casting yard for the girders is located at Shakkar Parian in Islamabad where an independent batching plant has been established.

c) Quality Control

- The cylinders for testing of concrete strength are being filled regularly and being tested at laboratory for 7 days and 28 days strength.
- The slump tests of concrete are not being carried out at site due to closely located batching plant.
- The batching plants have been properly calibrated.
- The tests indicate that the strength of concrete and of the reinforcement is above the required one.

d) Observations by QIT

- The overall quality of concrete work is just satisfactory.
- It was observed that the concreting of the large sized pile cap was being done from one side through one chute only which was against the norms. The Contractor's and the Consultant's supervisory staffs were advised to use the pumps for concreting or use more chutes to avoid segregation and weeping of concrete.
- Also, the formwork was not found in true line and the extra lengths of the reinforcing bars were being cut through welding rods.
- Curing of concrete is being carried out with water and using hessian cloth where required.
- The cone and its other apparatus for slump test at the pouring location were not thoroughly cleaned which could give wrong results.
- It was observed at batching plant that the temperature of the concrete was 35.5^{o} C whereas the ambient temperature was 39^{o} C at 12 noon. The chiller was not cooling the water to the required temperature. This was against the material

engineer's instructions who had asked the supervisory staff to stop concreting after 10:00 AM or if the ambient temperature was above 32°C.

- The boring of piles was being carried out through both the methods i.e. the Augur Bucket method and Reverse Rotary method.

(iii) **Package RWP-III**

a) Package Description

Start point: Sixth Road, Rawalpindi

Finish Point: IJP Road, Faizabad, Rawalpindi

Route: On Murree Road up to Faizabad

Start Date: April, 2014

Finish Date: December, 2014

Total Length: 24.80 Km

Number of Bus Stations: 3

Supervision Consultant: NESPAK

Contractor: M/S LIMAK-Reliable JV. Pvt. Ltd.

As described earlier, the whole project is elevated on piers. However, it ramps down at IJP Road after taking left turn close to the building of Survey of Pakistan at Faizabad. The package relatively lies in open area as compared to previous packages.

b) Physical Progress

The work is in full swing and the overall progress of the project is ahead of schedule. A reasonable number of the piers are complete including transoms. Piling work is also sufficiently advanced (369 out of 584 complete).

The concrete batching plant and the casting yard (shared by ZKB) for the girders is located at Shakkar Parian in Islamabad.

c) Quality Control

- The cylinders for testing of concrete strength are being filled regularly and being tested at laboratory for 7 days and 28 days strength.
- The slump tests of concrete are not being carried out at site due to closely located batching plant.
- The batching plant has been properly calibrated.
- The concrete mix is the same as adopted for other packages; however it is being verified with the help of the tests.
- The tests indicate that the strength of concrete and of the reinforcement is above the required one.

d) Observations by QIT

- The overall quality of concrete work is good; no honey combing of concrete was observed.
- Curing of concrete is being carried out with water. The water pools prepared with sand over the pile caps and the fixing of the hessian cloth around the piers were found.
- The boring of the piles is being carried through Augur Bucket method and no case of tremie-chocking was reported.
- On some of the piling work, the concreting was being carried in the absence of the NESPAK supervisory staff.
- It was informed that concrete load was rejected at site due to slump issue and the batch was sent back for correction but its record was not maintained.
- The Contractor was rendering the surface of the piers side by side of their construction.

10. ISLAMABAD PACKAGES

(i) Package ISL-I

a) Package Description

Start point: IJP Road, Faizabad, Rawalpindi

Finish Point: Peshawar Morr, Kashmir Road, Islamabad

Route: On 9th Avenue, Islamabad

Start Date: 24 April, 2014

Finish Date: December, 2014

Total Length: 4.78 Km

Number of Bus Stations: 2

Supervision Consultant: NESPAK

Contractor: M/S Habib Construction Services Pvt. Ltd.

As discussed earlier, the MBS corridor in Islamabad is either on ground or below ground in the form of trench. The major works included are:

- One complete flyover over 9th Avenue
- One partial flyover (4 spans of flyover of RWP-3 over IJP Road)
- Addition of two underpasses adjacent to existing vehicular underpasses
- One bridge over nullah
- On ground road work
- Pedestrian underpass

The ramp walls of the flyovers are of Reinforced Earth. The girders of the flyover over IJP Road are prestressed precast box girders whereas the girders of the other flyover are cast in-situ reinforced concrete girders. The bridge on nullah has prestressed precast concrete I-girders. The vehicular underpasses are composed of U-shape concrete structure with cast in-situ reinforced concrete slab over precast inverted T-girders resting on walls. The pedestrian underpass is cast in-situ concrete box with very high walls at entrances.

b) Physical Progress

The project is in initial stages; however, the work on all major works has started. Piling work on both the flyovers is underway through both the methods of Augur Bucket Boring and Reverse Rotary Boring as per substrata requirements while a test pile has been cast already. The excavation for additional underpasses and the construction of concrete rigid pavement is in progress. The presence of utilities and some other on ground obstacles are impeding the progress.

The batching plant has been set up very close to the site but it is not functional yet. The location of precasting yard is yet to be finalized.

c) Quality Control

- Trial mixes for concrete mix design are underway.
- For rigid pavement and piles concrete, old design of concrete mix is being used with confirmatory trial mixes in progress.
- Curing of the rigid pavement concrete is being carried out with cuing compound.

d) Observations by QIT

- The overall quality of concrete work of the paved concrete is good; no honey combing of concrete was observed.
- The concreting of the paving slab is being carried out with the paving machine.
- There is no provision of forming contraction joints in the machine; therefore the joints are being formed with the through saw cut.
- During the visit of the paved slab, it was observed that no contraction joint had been saw cut despite the concrete had hardened. This is against the philosophy of the contraction joint as the late formation/cutting may result in uncontrolled formation of cracks.
- Curing of concrete is being carried out with curing compound leaving no area without compound.

(ii) **Package ISL-II**

a) Package Description

Start point: Peshawar Morr, Kashmir Road, Islamabad

Finish Point: Peshawar Morr, Kashmir Road, Islamabad

Route: On 9th Avenue, Islamabad

Start Date: April, 2014

Finish Date: December, 2014

Total Length: 0.72 Km

Number of Bus Stations: 1

Supervision Consultant: NESPAK

Contractor: M/S NLC Pvt. Ltd.

This is a package comprising of MBS structures and an interchange. The salient components are as follows:

- Three vehicular underpasses (VUP) of MBS
- Trench Section of MBS
- Three single span bridges
- Four pedestrian underpasses (PUP)
- Drainage culverts
- Two flyovers of Interchange
- Six ramps of Interchange

The VUPs are reinforced concrete structures with different heights ranging from 5.0 to 10.0 m and widths from 10.0 to 21.0 m. The walls have common base slab and the roof comprises of precast prestressed inverted T-girders and cast in place (CIP) concrete except one underpass which has a CIP concrete slab. One of the PUPs houses the bus station. The walls of trench section also have common base slab. One of the single span bridges is of precast prestressed I-Girders whereas the other two are of precast

reinforced girders with CIP slab. The super structure of these bridges is supported on pile through abutments. The drainage culverts and the PUPs are structurally similar having a box section and supporting the earth fill up to 5.0 m.

The superstructure of the two flyovers and the ramps is CIP prestressed single or double cell box section with concrete ribs at 3.0 m c/c to support 3.0 m overhang on each side of the box. The expansion joints have been provided after every third pier making the three spans continuous over the piers. The substructure comprises of rectangular piers flaring smoothly at the top and supported on group of piles of varying lengths of 35 to 45 m and the pile caps. The ramp walls and the abutments of the flyovers and the ramps are of Reinforced Earth.

b) Physical Progress

The work on the project is quite on initial stages. Both the Consultants and the Contractors are short of staff and machinery. The pile work for some piers has started but due to layer of shingle at some depth, the piling is slow. However out of two test piles, one test pile has been completed and tested. The excavation for the underpass is partially complete but preparation of bed, placing of lean concrete and fixing of base slab reinforcement is going side by side. The earth work for roads and ramps is also in progress. The formwork for the inverted T-girders is being erected at site.

The concrete batching plant is yet to be established; however the concrete is being obtained from another source by the Contractor. As the precast girders are relatively lesser in number, therefore the Contractor may not establish an inclusive precasting yard.

c) Quality Control

- The material testing laboratory could not be established yet
- The regular material engineer (ME) was not appointed yet, hence the ME from other package was carrying out the job at the moment.
- For steel testing, one test from each source of three was done so far at UET, Taxila.

- One Proctor test for sub-grade of the underpass base was also done.
- The cylinders for pile concrete were being filled and tested regularly.

d) Observations by QIT

- The site inspectors and engineers are quite young and do not have the required experience.
- The piling work was in progress but the quantity of concrete being consumed was exceptionally high in spite the depth was actually reduced. It was informed that a layer of gravelly material was present about 13m depth from ground surface and that was the main cause of these problems. Thus during lowering of the steel cage, the loose of the layer deposited at the bottom of bore which could not be removed properly. The supervisory staff was advised to consult the geotechnical expert for advice.
- The deep excavated areas were not properly cordoned off for protection of public safety.

(iii) **Package ISL-III**

a) Package Description

Start point: Peshawar Morr, Kashmir Road, Islamabad

Finish Point: Centaurs, Islamabad

Route: On 9th Avenue and Jinnah Avenue, Islamabad

Start Date: 23 April, 2014

Finish Date: December, 2014

Total Length: 2.90 Km

Number of Bus Stations: 4

Supervision Consultant: NESPAK

Contractor: M/S Maqbool-Calsons JV. Pvt. Ltd.

The salient features of the package are as follows:

- Four vehicular underpasses (VUP) of MBS
- Trench Section of MBS
- One pedestrian underpass (PUP)

Out of four VUPs, three are cast in placed reinforced box sections whereas roof of the forth one is composed of precast prestressed inverted T-girders with CIP slab. The 1.10 Km trench section and the PUP are similar to those of other packages of Islamabad.

b) Physical Progress

The excavation of the trench section and the underpasses is in full swing and is as per schedule. On one portion, the reinforcement for the base slab of the curved VUP was in progress. No other structural work yet started because of utilities shifting issues at number of places.

The concrete batching plant has been established at Shakkarparrian, Islamabad.

c) Quality Control

- The concrete mix is the same as adopted for other packages; however it is being verified with the help of the tests.
- The cylinders for testing of concrete strength are being filled regularly and being tested at laboratory for 7 days and 28 days strength.
- The slump tests of concrete are not being carried out at site due to closely located batching plant.
- The batching plant has been properly calibrated.
- The reinforcing steel from Pak Steel Mills is being used and tested.

d) Observations by QIT

- The quality of lean concrete and the fixing of reinforcement was satisfactory in the under construction VUP.
- The over excavated area due to change in profile of the base slab was not being properly backfilled and compacted which could result in the local deflection or settlement of the slab.
- Old drawings are not being superseded properly by the new ones.

(iv) **Package ISL-IV**

a) Package Description

Start point: Centaurs, Islamabad

Finish Point: One Km short of Shaheed-e-Millat Road, Islamabad
Route: On Jinnah Avenue, Islamabad

Start Date: 20 May, 2014

Finish Date: December, 2014

Total Length: 3.17 Km

Number of Bus Stations: 3

Supervision Consultant: NESPAK

Contractor: M/S ZKB. Pvt. Ltd.

The salient structures of this package are as follows:

- Two vehicular underpasses (VUP) of MBS as addition to the existing ones
- One crossing of existing VUP
- Three pedestrian underpasses (PUP)
- Widening of existing flyover at Centaurs

This MBS in this package is totally on grade and runs in the middle of Jinnah Avenue. It crosses the 8th and 7th Avenue where already

vehicular underpasses exist. Therefore additional underpasses have been added to these ones using inverted T-girders as part of their roof. Also, these girders have been used for the bus station over the existing underpass to avoid its overloading. The PUPs are similar to the PUPs of other packages. The existing flyover on Jinnah Avenue has been widened by adding two lanes on one side and one lane in the middle. This is being achieved constructing the flyovers using the same shape of piers and girders (tub girders) that of the existing one.

b) Physical Progress

As the project has just started, therefore there is no appreciable progress on this package. The excavation for the additional underpass on one side of the existing underpass at 7th Avenue is underway whereas the road work on the Jinnah Avenue has also started. The project area is being cordoned off with the corrugated steel sheets where possible.

The batching plant has not yet been installed.

c) Quality Control

- As the project has just started, therefore there is no activity regarding reinforced concrete works.
- No concrete mix design has been finalized so far.

d) Observations by QIT

- The excavated base and sub-base of the existing roads was just being thrown away. It was advised by the QIT that the excavated material should be piled separately according to their type.
- The quantity of re-useable excavated road material shall be adjusted in the Contractor's bill.

(v) **Package ISL-V**

a) Package Description

Start point: One Km short of Shaheed-e-Millat Road, Islamabad

Finish Point: Pak Secretariat, Islamabad

Route: On Jinnah Avenue, Islamabad

Start Date: 23 April, 2014

Finish Date: December, 2014

Total Length: 2.21 Km

Number of Bus Stations: 3

Supervision Consultant: M/S ECSP as sub-consultant of NESPAK

Contractor: M/S: M/S LIMAK-Reliable JV Pvt. Ltd.

The salient features of the package are as follows:

- Three vehicular underpasses (VUP) of MBS
- Extension of existing VUP
- Trench Section of MBS
- Covered Trench Section for Bus Station
- Two pedestrian underpasses (PUP)

The three new underpasses are the typical concrete box sections whereas the extension will comprise of extension of existing walls and the roof slab of the existing underpass. The trench section is similar to the other packages except at one bus station location where inverted T-girders with CIP deck slab will be used.

b) Physical Progress

The project is behind schedule by seven days. The presence of numerous water supply pipelines with small to very large diameters near the terminus is also causing delay. The meetings with the Client are held to resolve this issue at the earliest. The excavation for trench section is in progress but stability of the cut section is problem due to gravelly substrata. The placing of lean concrete has also started in some areas of the trench section.

The batching plant has been installed at ....., Islamabad.

c) Quality Control

- New concrete mix design is under trial at the laboratory.
- Testing of reinforcing steel has not yet started.
- Calibration of concrete batching plant is yet to be carried out.

d) Observations by QIT

- The record keeping is good
- Meetings with the Client and the Contractor are being held regularly.
- Safety measures taken are better than the other packages. The steel sheets, warning tapes and use of lamps at night around the excavated pits and other work area are being applied.
- Sprinkling of water is being carried out regularly for the dust control.

11. Precasting Yard

a) Description

The precasting yards for prestressed box girders and inverted T-girders etc. of the following packages are located at Shakkarparian, Islamabad:

RWP-I

RWP-II

RWP-III

ISL-I

ISL-II

ISL-IV

Each Contractor has its own yard except M/S ZKB and M/S LIMAK-Reliable JV who share the same yard. These yards have

their own concrete batching plants in their premises. Separate beds have been prepared for the two types of girders. For the inverted T-girders, the beds are made of concrete whereas for box girders, the Contractor is using steel formwork for their soffits.

b) Physical Progress

The casting of girders for packages RWP-II and RWP-III is fairly good. The casting of other packages is yet to start. However, the prestressing of the girders with 28 day's strength is yet to be started.

c) Quality Control

- The cylinders for crushing strength of concrete are being cast at site at the time of concreting of the girders and being tested in the lab.
- Testing of prestressing steel is underway.
- All the records of concrete work and being maintained satisfactorily.

d) Observations by QIT

- The concrete finish of the girders is excellent.
- No honey combing of concrete was found.
- The curing is being carried out with water and hessian cloth is also in use.
- The key in box girders for CIP concrete slab was as per tender drawing instead of construction drawing. This was done for ease of construction as per Contractor but there was no approval in black and white from the designer or supervision staff.
- Slight adjustment in the tendon profile had been made with the consent of the designer.
- The construction joints lines on the surface of the girders were being repaired where required.
- The supervisory staff was asked to reflect all the changes in design on the "AS Built" drawings.

HASEEB A. KHAWAJA

(Member)

ABDUL BASIT

(Member)

AHSAN G. HASAN

(Member)

Syed Mohammad Nadeem

(Co-opted Member)