



Problems in construction of large sized sewers

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THE SCHEME FOR remodelling of sewerage system of twin cities of Hyderabad and Secunderabad, was prepared by Municipal Corporation of Hyderabad in the year 1981, at a cost of Rs.75.00 Crores for execution in three stages. The stage-1 of the scheme costing Rs.24.30 Crores consisting of 9 trunk sewers and Remodelling of Sewage Treatment Plant and branch sewers was administratively sanctioned by the Government in 1982. Out of the above 4 Trunk sewers and Treatment Plant works were awarded contracts in January, 1986 and One Trunk sewer was awarded contract in 1989 as noted below.

- 1) Laying of Duplicate 'K&S' main - 18.95KM
- 2) Laying of Duplicate Out fall sewer - 3.22 KM
- 3) Extension of 'H&L' Main - 1.95 KM
- 4) Laying of Duplicate 'A' main - 4.96 KM
- 5) Laying of Duplicate Kalasiguda main - 2.75 KM
- 6) Remodelling of existing Sewage Treatment Plant - 25 MGD

Duplicate 'K&S' main

The main objective of laying Duplicate 'K&S' main is to relieve the load on the existing 'K&S' main and also to reduce pollution entering the Hussainsagar lake.

The Duplicate 'K&S' main starts near I.D.P.L. Balangar and ends at the Amberpet sewage treatment plant. Due to afflux of time between the years of preparation of estimate and execution, many structures came up which resulted in change of alignment particularly in the reaches of 1600mm dia and 1800mm dia along the surplus channel of the Hussainsagar lake.

In the 600mm dia reach along the Railway track leading to I.D.P.L. Factory, rock cutting to a depth of 6.50 metres had to be carried out. The rock was of soft disintegrated one and could not be taken out with crow bars. Holes had to be drilled with compressor. Even though the holes drilled were deeper the top 15cm rock only could be removed. The 50 meters stretch in this reach took about 6 months to complete.

In the major portion of 900mm dia reach along the Balanagar and Kukatpally rock, black cotton soils were met with.

In 1200mm dia reach, which passes along the Balanagar. Bowenpally Road upto Shobana Theatre, crosses the Jeedimetla nala and passes behind to Airport run way, two storm water drains had to be crossed. For that the storm drain invert levels was higher than the top of the maximum size of C.I. pipe proposed for syphon. It was

decided to lay the 3 Nos. of C.I. pipes (780, 700 and 500mm dia) for syphons and allow the storm drain over them. Accordingly, two manhole chambers were constructed on either side and the sewer line completed with 3 Nos C.I. pipes (Syphon) for this reach.

At the crossing of Jeedimetia Nala it was possible to take the line on Pedestals without any difficulty and the syphon was avoided. In this reach behind the Airport Run way the rock was removed by chiselling as the Airport authorities did not permit even for mild blasting.

The next difficult reach was behind Patigadda. In this reach, the 1400mm dia sewer passes along the Railway line and a slum. The depth is upto 9.0 meters and the rock is protruded above the ground level. Even for mild blasting every precaution had to be taken, duly keeping in view the passing of trains. It took almost an year to complete the stretch of 10000 meters.

Behind the Patigadda quarters the sewer line crosses the Railway line The Railway authorities estimated that the cost of crossing would be Rs.78.00 lakhs. It was decided to construct an R.C.C. Duct of 4m x 4.50 meters, capable of carrying 2 Nos of 1400mm dia pipes side by side. The additional capacity is provided for future requirements. The invert of pipe line at this Railway crossing is 8 meters below rail level.

The most difficult reach of the Duplicate 'K&S' main was along the Sanjeevaiah park road from Sanjeevaiah park to Tank bund. The length of this reach is 1.8 KMs. The firm M/s. Indian Hume Pipe Company tried their level best in 1990 and in 1992 but could not do the work with ordinary shoring. The entire reach is with filled up soil and the depths were ranging from 7.5 meters to 9 meters. M/s Indian Hume Pipe Company represented that this reach can not be done with the shoring provision made in the estimate and requested for higher rates. Board Officials were deputed to Bombay to study the method of laying sewer line in loose soils. The work had to be carried out by providing double stage shoring. A contracting firm from Bombay, which was executing the sewer lines was asked to quote for this work. The firm had quoted a rate of Rs.30,000/- per meter for laying and jointing of 1400mm dia sewer. The Bombay S.S.R. provides for a rate of Rs9,500/- per meter in loose soils with double stage shoring. The firm which was executing the work i.e. M/s. Indian Hume Pipe Company came forward to do the work at Bombay S.S.R. rate. Then the Board decided to award enhanced rates for this reach of 1.8 KM to M/s. Indian Hume Pipe Company and the

additional commitment was Rs.142.00 lakhs. The work had been complete in a span of 8 months.

In this reach only, the sewer line for a stretch of 87 meters passes under water. 2.0 meters below the water level. The entire stretch was first filled with gravel upto 0.5 meter above water level. Then the trench was excavated with the help of an excavator and the pipes were laid with the help of crane. Concrete bedding, anchoring and cradling was done to avoid flotation. To cross Tank Bund Road, it was proposed to take the sewer by tunneling. It was decided to lay a 2000mm dia RCC Sewer to cater the future requirements also. The work was carried out by specialized pipe jacking technique by M/s. Cemindia Company Limited, Calcutta. It was executed from two directions at a depth of 11 meters and at the junction point a manhole was constructed.

The tunnel work was completed with in a period of 8 months. The two tunnels were connected by a manhole on the main road of tank bund. This manhole has been casted from top to bottom to avoid wider open excavation.

In the 1600mm dia reach the sewer line had to cross Indira Park Road, after starting the laying work, it was found that the cables were obstructing the pipe. The cable duct interfered with the sewer line to an extent of 0.4 metres. The it was decided to lay 2 rows of 1200mm dia pipes by constructing two manholes on either side of the road.

In the 1800mm dia reach the first problem encountered was under the Fever hospital bridge in Nallakunta. In the widened portion of the bridge, the span is 12.5 meters, which was more than enough to take the 1800mm dia sewer. But in the old bridge portion the span is only 2.5

meters. It was found very difficulty to carry the 1800mm dia pipe through this span. Then it was decided to have duct in this portion of the bridge. The outer edge of the duct is abutted to the piers of the bridge and on either side of the duct manholes are provided.

At the Amberpet bridge crossing, the vent top was obstructing the pipe. At the bottom, Pedestals were required to get invert level. To over come this difficulty a duct was proposed and its width was decided to have the same carrying capacity and the duct was constructed on R.C.C. columns and beams (Point No.10). Near the Lingampally syphon, the road width is so small, that both Duplicate 'K&S' main and Duplicate out fall sewer could not be taken side by side. Then it was decided to have a common duct for both the sewers. Fortunately the invert levels were equal at this point. A common duct of size 2.1m x 2.1m was constructed for a length of 75 meters.

Duplicate outfall sewer

This sewer of 1800mm dia size starts from Chaderghat bridge and joins the Treatment Plant inlet at Amberpet in a length of 3.22Km. The first 1.5Km stretch met with heavy rock cutting. The controlled blasting had been done in the nights since it was not possible to control the traffic in day time.

The second problem encountered was at the Amberpet grave yard. The sewer had to cross the water line, storm water drains. It was carried out by duct and pipes on Pedestals.

The crossing of the Hussainsagar surplus Nala was another problem that was tackled. The pipe line was proposed to be taken on a bridge.