

PLANNING AND DESIGN OF SEWERS USING ADVANCED TECHNIQUES FOR PROPOSED SEWERAGE SYSTEM OF DISTRICT- I FOR KANPUR CITY UNDER NGRBA PROJECT

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ABSTRACT

National Ganga River Basin Authority (NGRBA) has taken up sewerage project in Allahabad & Kanpur cities for abatement of pollution and conservation of River Ganga. The objective of NGRBA is to provide integrated sewerage system for collection of sewage and providing STP for treatment before discharging sewage into River and thereby preventing pollution of river Ganga and for sustainable development of surrounding areas.

TATA Consulting Engineers Limited (TCE) was appointed by NRCD (NGRBA), MoEF for providing Consultancy Services for "Technical Review, Financial Analysis and Preparation of Bid Documents of projects under NGRBA for Kanpur District- I & Allahabad District- A and District- C sewerage system".

Sewerage District – I of Kanpur city is an old area and located in northern part of the city with major portions located on the bank of Ganga River. Out of 34 wards of District-I, 11 wards were selected in sub-project area, comprising of existing sewer network of about 100km length, for which TCE prepared the DPR. Project area of 11 wards is very congested and having narrow streets. From the detailed study, it was learnt that laying of new sewers in congested, narrow streets and proposing parallel sewers to existing one would be very difficult task and a big challenge. Efforts were made for the optimum usage of existing sewers to the extent possible. Physical survey was carried out for obtaining the details of existing large sized sewers in consultation with ULB and UPJN. The sewer conditions (including manholes) were observed by opening manhole covers and noting the depth of sewers and extent of siltation. The alignment of sewers were verified at site with ULB.

In proposed sewerage system, the existing sewers which were in good condition and laid within past 15-20 years, are utilized in overall planning and designing for next 30 years horizon. The silted sewers which are in good condition are proposed to be used after desilting. Heavily silted sewers are being discarded. The sewers of 400mm dia. and above sizes are proposed for internal lining by rehabilitation techniques. The rehabilitation methods suggested are GRP slip lining for egg-shaped sewers and polyurea lining for circular sewers. In critical and congested junctions, sewer laying by trenchless technology method is proposed. At narrow streets, the use of HDPE pipes and pre-cast RCC manholes is proposed to speed up the work.

The benefits of utilizing existing assets are: i) improvement in the environmental conditions; ii) minimization of public inconvenience and traffic disruption and iii) resource conservation by reducing the requirement for procurement of new pipes. Other benefits envisage that construction time is expected to reduce by 6 months by avoiding major pipe trench excavation, laying work, and procurement time of new pipes, enhancing carrying capacity of sewers by providing internal smooth lining, avoiding the chances of damage to foundation of nearby structures. Health and safety aspects are considered and specified in the tender document.

Various project documents were prepared and submitted such as Detailed Project Reports, PQ documents, Tender Documents, Financial Analysis Reports which were reviewed by various authorities and Appraised by the World Bank.

Key words: Ganga River, Sewers, Rehabilitation, GRP Lining, Polyurea Lining, Public inconvenience

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