

ANNEXURE I

Technical Quality Audit Parameters: Sewerage Schemes

Pre-implementation Stage

Sr. no.	Parameter	Benchmark	Reference document	Indicator	Sub indicators	Max. marks	Marks obtained	Weightage
1	Planning & Design	Technical Framework in comprehensive Planning	DPR	Part A: General Parameters				
				1.1) Survey & investigation	1.1.1) Topographic Survey	3		25%
					1.1.2.) Soil investigations such as bearing capacity (SBC) and ground water table / spring water level)	3		
					1.1.3) Land Acquisition, Forest clearance etc.	3		
					1.1.4) NOC from Railways, Electricity Board, water Resources, Roads, Panchayat	5		
				1.2) Demand and Resource assessment	1.2.1) Population growth, Floating Population, Institutional, Commercial Development & seasonal variation	5		
				1.3) Cost Analysis, Budget planning, timeline estimates	1.3.1) Financial implication with cost index up to implementation period.	3		
					1.3.2) Identification of funding agency with annual budget allocation	3		
				1.4) Framing specification	1.4.1) Identification of suitable materials proposed to be used	3		
					1.4.2) Framing specifications for materials at the time of preparation of estimate/Bid Document	2		

				Part B: Parameters relating to Sewerage System			
				1.5) Preliminary spade work for laying of sewer	1.5.1) Assessment of existing sewer infrastructure and its uses.	5	
				1.6) Selection of technology for network design	1.6.1) Use of latest software for pipe network and drawings.	5	
					1.6.2) Preparation of L-sections of sewer lines	5	
				Part C: Parameters Relating To Sewage Treatment Plant (STP)			
				1.7) Selection of modern Technologies & equipments and processes	1.7.1) Optimum design of STP with advanced treatment technologies	10	
					1.7.2) Use of modern mechanized/digital equipments such as : (i) Remote Monitoring, (ii) SCADA, (iii) GIS (Geographic Information System), (iv) Smart Pumping Systems, (v) Online effluent Quality Analyzers (vi) Mobile Applications, (vii) Customer Portals (viii) Drone Photography (ix) VFD etc.	10	
					1.7.3) Obtaining consent to establish from State Pollution Control Board	5	
					1.7.4) Preparation of design and drawings by consultant and approval by competent authority of the department.	5	
				1.8) Long term Planning	1.8.1) Future requirement projections such as vacant space for expansion and modular design of STP	4	
					1.8.2) Provision for reuse and disposal of treated effluent with the consent of concerned department	5	
					1.8.3) Provision for sludge management	4	
					1.8.4) Horticulture Planning for Sewage Projects (Pump Houses & STP Sites)	2	
				1.9) Reducing O&M cost	1.9.1) Provision of solar energy	5	
					1.9.2) Provision of automation	5	
				Total		100	

IMPLEMENTATION STAGE

Sr. no.	Parameter	Benchmark	Reference	Indicator	Sub Indicators	Max. marks	Marks obtained	Weightage	
2	Execution, Inspection and testing	Technical Methodology for implementation and inspection & testing	Contract Agreement and test reports	Part A: General Parameters					
				2.1) Use of all construction materials	2.1.1) Procurement of materials such as cement, steel, coarse and fine aggregates, etc. from approved source.	5		40%	
					2.1.2) Use of design mix.	5			
					2.1.3) Procurement of pipes and machinery of approved make and manufacturer.	5			
					2.1.4) Carrying out tests at manufactures' premises before dispatch.	5			
				2.2) Supervision by skilled manpower/ TPIA	2.2.1) Deployment of adequate & appropriately qualified personal at site.	5			
				2.3) Documentation and Reporting	2.3.1) Preparation of site inspection and quality control registers.	5			
					2.3.2) Checking of test results by Engineer in Charge.	4			
					2.3.3) Rectification of defects.	5			
					2.3.4) Submission of reports and keeping the record.	4			
				Part B: Parameters Relating to Laying of Sewerage					
				2.4) Conformity to relevant standards /design	2.4.1) Physical inspection of pipes at site before laying.	2			
					2.4.2) Work execution as per originally approved bid document. 2.4.3) Maintaining slopes for laying of pipes (as per design) for achieving gravitational flow of sewage.	10 5			

				2.5) Making good the dismantled surfaces	2.5.1) Dismantled roads and streets are repaired properly and dismantled material disposal.	10		
				Part C: Parameters relating to Construction of STP				
				2.6) Pumping system efficiency enhancement	2.6.1) Use high efficiency pumps, motors & diffusers/blowers specifically designed for site requirements.	5		
					2.6.2) Installation of various modern equipments as per Bid document.	10		
				2.7) setting up of testing laboratory and consent from Pollution Control Board	2.7.1) Setting up effluent testing laboratories at STP Site.	5		
					2.7.2) Provision for reuse and discharge of treated effluent made and consent obtained from concerned department.	5		
					2.7.3) Obtaining Consent To Operate from State Pollution Control Board.	5		
					Total	100		40%

COMMISSIONING

Sr. no.	Parameter	Benchmark	Reference	Indicators	Sub Indicator	Max. marks	Marks obtained	Weightage			
3	Commissioning and Hand over	Guidelines for commissioning and handover	Completion report and	Part A: General Parameters					10%		
				3.1) Guarantee of works	3.1.1) Post commissioning Monitoring and support.			5			
					3.1.2) Withholding of security deposits.			5			
					3.1.3) Submission of Assets completion Plan and completion report by Agency and certificate by Department.			5			
				Part B: Parameters Relating To Sewerage							
				3.2) Testing and functionality	3.2.1) Flushing of pipelines.			5			
					3.2.2) All proposed connection made to the sewer system.			5			
				Part C: Parameters Relating to STP							
				3.3) Testing of system and Functionality of STP	3.3.1) Cleaning of STP.			5			
					3.3.2) Ensuring proper operation of all modern equipments installed at STP, as per bid document, including SCADA, online analyzers and VFD etc.			10			
					3.3.3] Automation of STP operations.			15			
					3.3.4) Ensuring specified quality of treated effluent.			25			
					3.3.5) Preparation of Manual on Standard Operating Methods and Procedures for STP.			10			
					3.3.6) Emergency response mechanism such as stand by arrangement of machinery etc.			10			
Total						100		10%			

SAFETY AND SECURITY

Sr. no.	Parameter	Benchmark	Reference	Indicator	Sub Indicator	Max. marks	Marks obtained	Weightage
4	Safety and Security	Guidelines for Project Management	Bid document	4.1) Adherence to safety standards	4.1.1) Providing of safety measures such as steps to be taken at the time of deep excavations (Shoring, caution boards, barricading, night signals etc).	3		5%
					4.1.2) Providing of safety measures such as steps to be first aid & firefighting equipments, safety uniforms, gas release vents etc.	2		
				4.2) Safety measures for workers and users	4.2.1) Access control			
					4.2.2) Detection, alert and remedial measures in case of for chlorine gas leakage, if applicable.	1		
					4.2.3) compliance of safety measures as per provisions of labour laws.	2		
				4.3) Security measures	4.3.1) Physical Security measure.	1		
					4.3.2) Incident response and reporting.	1		
Total						10		5%

PROJECT MANAGEMENT

Sr. no.	Parameter	Benchmark	Reference	Indicator	Sub Indicator	Max. Marks	Marks obtained	Weigh tag			
5	Project Management	Guidelines for Project management	Agreement with Executing Agency	Part A: General Parameters					10%		
				5.1) CPM/PERT charts	5.1.1) Preparation of CPM/PERT Charts for	10					
				Part B: Parameters Relating To Sewerage							
				5.2) Adherence to Time Lines and cost estimates as per Agreement	5.2.1) Adhering to time lines of the project for Sewerage pipelines as per Agreement	10					
					5.2.2) Adhering to cost estimates of the project for Sewerage pipelines as per Agreement	10					
				Part C: Parameters Relating To STP						10	
				5.3) Adherence to Time Lines and cost estimates as per Agreement	5.3.1) Adhering to time lines of the project for Sewage Treatment Plant as per Agreement						
					5.3.2) Adhering to cost estimates of the project for Sewage Treatment Plant as per Agreement	10					
Total						50		10%			

OPERATION AND MAINTENANCE

	Parameter	Benchmark	Reference	Indicator	Sub Indicator	Max. marks	Marks obtained	Weightage		
6.	O&M	Procedure for effective maintenance	Assets management, plans and Manual on SOMP	Part A: General Parameters				100%		
				6.1) Timely rectification of defects	6.1.1) Grievance redressal and record keeping		5			
					6.1.2) Maintenance schedule development and its compliance		5			
					6.1.3) Availability of spare parts/stand by machinery		5			
					6.1.4) Training and Capacity building		5			
				Part B: Parameters Relating To Sewerage						
				6.2) Proper running of sewers	6.2.1) Timely jetting/cleaning of sewers and manholes		5			
					6.2.2) Timely running of pumping sets installed at Intermediate Pumping Stations		5			
				Part C: Parameters Relating To STP						
				6.3) Effective operation of STP	6.3.1) Random Sampling of Treated Effluent		5			
					6.3.2) Ensuring specified Quality of effluent		15			
					6.3.3) Ensuring specified Quantity & Quality of Sludge		10			
					6.3.4] Alarm system for Chlorine gas leak detection		3			
					6.3.5) Deployment of skilled staff for operation and maintenance		5			
					6.3.6) Deployment of adequate staff for O&M		5			
					6.3.7) Running as per operation manuals on SOMP/Design		5			
					6.3.8) Ensuring reuse of treated effluent		10			
					6.3.9) Ensuring appropriate disposal of sludge		5			
					6.3.10) Regular chlorination of effluent		5			
					6.3.11) No penalty of electric bill for low power factors, overload, delayed payments etc.		2			
Total						100		100%		

Sr. No.	Parameter	Marking Criteria	Weightage (%)	Marks obtained
1	Design and Planning		25*	
2	Execution, Inspection and Testing		40*	
3	Commissioning and Handing over		10*	
4	Safety Measures		5*	
5	Project Management	Adherence to project timelines and Cost Projections	10*	
6	Environmental Measures	Consideration of environmental factors like sustainability, eco-friendly construction practices	5	
7	User Feedback	Feedback from beneficiaries, stakeholders to assess their satisfaction levels	5	
TOTAL			100	
1	Operations and Maintenance		100*	
TOTAL				

*The breakup of the weightage is given in the detailed framework for these parameters

* Parameters that are not applicable to a specific project will not be considered in the audit scoring. The weightage will be adjusted accordingly

