

Model Operation and Maintenance Tender

Guidelines



Gujarat Water Supply and Sewerage Board
Government of Gujarat

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Restructuring O&M contracts

Through the knowledge base created by years of operations and experience gained, GWSSB has gathered insights into some key issues faced during the O&M of the scheme. Some of these issues identified through multiple rounds of deliberation are as follows:

- ▶ Fragmented approach in O&M contract packaging: Multiple civil and electromechanical agencies engaged for O&M of various components within an RWSS
- ▶ Short period of O&M contract (2 years): Resulting into repetitive administrative tasks for GWSSB
- ▶ Lack of proper documentation during transition: Dispute regarding responsibility of a damaged asset. Pre-contract and post contract asset condition tracking is difficult. Many of board's assets become non-functional due to such issue.
- ▶ Lack of capacity, skill and commitment from agencies: Due to fragmentation approach, a lot of small O&M contractors are engaged. They lack in organizational knowledge and qualifications. Further, absence of qualification criteria when estimates are less than INR 7 Cr adds to the issue.
- ▶ Lack of skilled and competent manpower: There is no uniformity in skills and qualifications sought by GWSSB across various tenders.
- ▶ Reactive O&M approach "repair upon breakage": Contracts are not formulated for sustenance of WS schemes and maintaining the asset. Preventive maintenance schedules and provisions may be already incorporated in the existing contracts, however, enforcement of the same is weak.
- ▶ Absence of incentive mechanism: Agencies are not motivated to resolve legacy issues in the system and improve performance
- ▶ Lack of transparency in contract: Provision of existing situation in the contract is required. This will mean upfront declaration of technical issue- habitations at bidding stage. The agency will have better data to gauge the situation and prepare quotes in accordance.
- ▶ Duplication in deductions or prorated payments: The agency, based on its experience or discussion with the tendering authority submits a "below" estimated quote (understanding that there are certain technical issue-habitations). During billing, again there is pro-rate reduction for non-supply to technical habitations. This issue is a primary result of non-transparent RFP.

Need for restructuring: The responsible operation and maintenance of assets is crucial for extending the lifespan of assets, reducing number of breakdowns, minimizing downtimes, and reducing reactive maintenance costs. By reducing downtimes, we achieve lower interruptions in water supply and ensure water security for the beneficiaries in the state. At the same time, comprehensive and timely reporting of operation and maintenance parameters is necessary to ensure accountability and resilience of the system. Thus, a comprehensive O&M structure is required to streamline processes and address existing issues. The document will provide guidelines for the systematic implementation of some key aspects of the restructured O&M tender. This exercise aims to ensure proper and efficient management of GWSSB's assets, increase asset lifespan, thus increasing the overall system efficiency in the long term.

Actions: GWSSB is in process to finalize a revised model O&M tender which will address the legacy systemic issues in contracts. Some key areas of changes are:

- **Comprehensive O&M contracts** for electromechanical and civil services.
- **Longer period of O&M contract: 5 years**
- Among the restructuring are some important aspects which will undergo major transformations such as: a) Bidder's eligibility criteria, b) Manpower qualification and requirement, c) payment terms, incentives and penalties, d) Scheduled maintenance activities and enforcement, e) Price bid format and tender estimates, f) Exit management, g) Contract packaging and h) Additional information in tender.

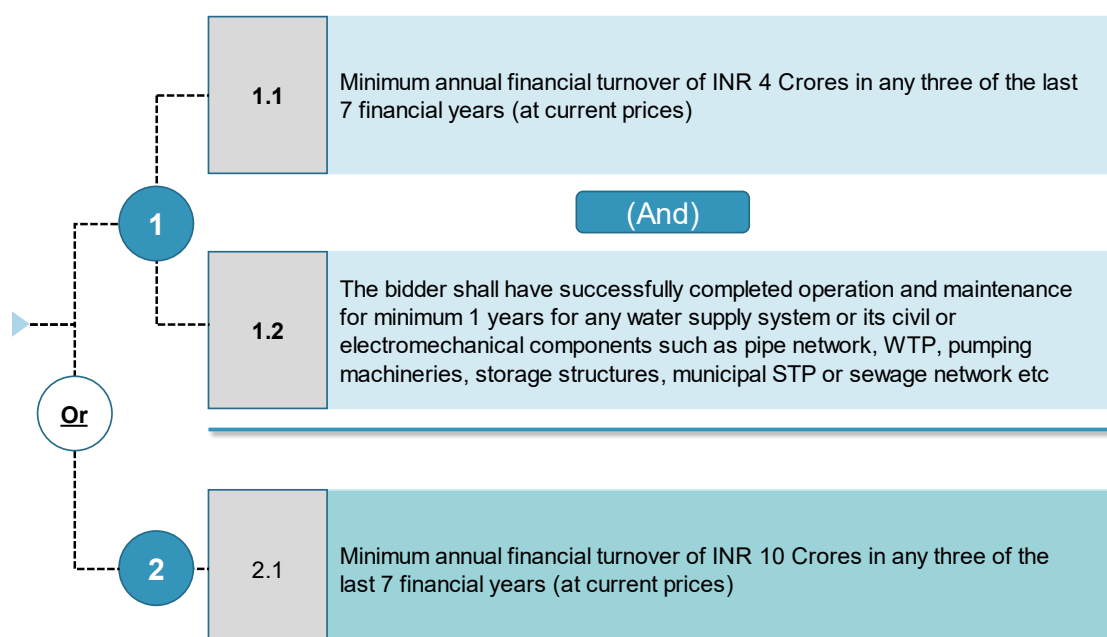
This document will act as guidelines for the practitioners to improve O&M sustainability.

1 Bidder's Eligibility Criteria

Eligibility criteria are formulated in 3 categories viz. i) General, ii) Financial capacity and iii) Similar experience. For ii) and iii), GWSSB will provide two options to the bidders, any one of which is required to be eligible to bid. These options include a) financial criteria + WS O&M experience and b) only financial criteria and no experience requirement. This is aimed to induce more competition and allow new participants in bidding. It is expected that the streamlining in contract packaging will result in uniformity of estimated cost and hence can be dealt with fixed eligibility criteria.

Note on General Requirements: Mandatory requirement of 'A' class registration in R&B in civil or electrical category and an 'Electrical contractor's license' from Electric Licensing Board of Gujarat. This is non-negotiable requirement.

Note on Financial Capacity & Experience requirements: As already stated in this chapter, any bidder will have two options to choose from. A bidder with water supply or urban sewage O&M experience will require a minimum turnover of INR 4 Cr and a bidder with no experience will require a minimum turnover of INR 10 Cr. Refer the illustration below:



2 Manpower Qualification & Estimating Requirements

Included in Annexure III Vol-1 of the tender document, the schedule of establishment includes qualification and experience criteria for skilled and unskilled personnel which the contract shall deploy. The educational and experience requirement have been revised and their roles have been defined broadly. The establishment schedule will also include utility vehicle for pipeline inspection and repair team. The staffing requirement has been reworked and provided in the tender document as guideline for estimating manpower requirement.

Some new provisions include an O&M manager in every contract for coordination, SCADA operator, dedicated electrician for category A pumping station, data entry operator, sweeper and outdoor premise maintainer.

Further to the guidelines, tendering authority shall review requirement on case basis to address shift management (i.e. if additional staff is required). A sample table for estimating manpower requirement is shown below for illustration.

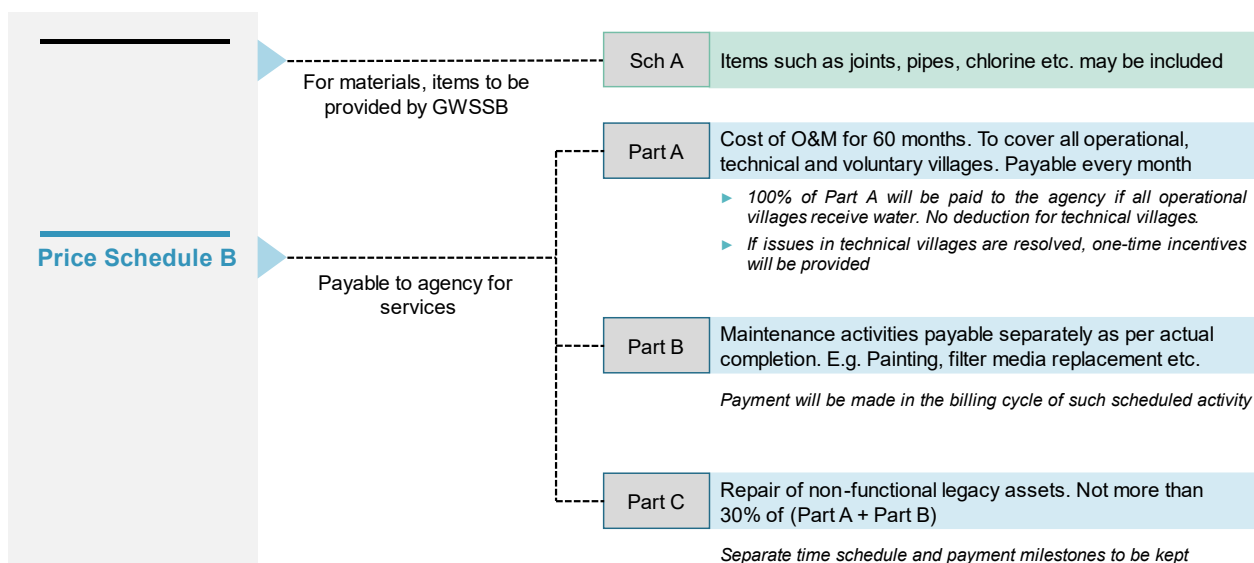
Asset Data					
Nos of V+C	148	Filter plants	1 nos.	Total area of premises	100000 sqft
Pipe Network	550 km	PS	5 nos. + 1 (Cat-A)	Premises (>2500 sqm)	3
		Laboratory	1 nos.		

Example:

Sr. No.	Position	Guidelines	Asset data	Requirement (nos)
A	B	C	D	E
1	O&M Manager (7 YoE)	1	N/A	1
2	Maintenance Engineer (5 YoE)	1	N/A	1
3	Asst. Maintenance Engineer (1 YoE)	1 per subdivision	2 subdivisions	2
4	Operators (1 YoE)			
a	for filter plant and chlorination	2 per plant	Filter Plants: 1 nos	2
b	for pumping station	1 per PS	Total PS: 6 no.	6
5	SCADA Operator (1 YoE)	1 per control centre	Control centre: 0	0
6	Electrician (3 YoE)	1 per 5 pumping station + 1 per category A pumping station	PS: 5 nos. + 1 (Cat-A)	1 (for 5 PS) + 1 (dedicated for Cat-A PS)
7	Lab in charge/ Chemist (1 YoE)	1 per lab	Laboratory: 1 nos	1
8	Pipeline inspection, repair and distribution			
a	Pipe Fitter (0.5 YoE)	1 per 50 km	Network length: 550 km	550/50= 11 nos
b	Valve man (0.5 YoE)	1 per 10 villages	148	148/10= 14.8 (say 15)
9	Data Entry Operator	1	N/A	1
10	Helpers			
a	for fitter	2 per 50 km	Network length: 550 km	(2*550)/50= 22 no.
b	for filter plant operators	2 per plant	Filter Plants: 1 nos	2
c	for pump operators	1 per PS	PS: 5 nos. + 1 (Cat-A)	6
d	for laboratory (sampling testing)	1 per lab	Laboratory: 1 nos	1
11	Sweeper	1 per 20,000 sqft area	1,00,000 sqft	5
12	Outdoor campus maintainer	1 per premise (only larger than 2500 sqm)	Large premises: 3 nos.	3
Total Manpower required				~81 no.
13	Utility vehicle (4-seater pickup)	1 per 250 km	Network length: 550 km	550/250= 2.2 (say 2)

For estimation of staff cost (establishment cost), the rates provided in estimation section may be used as reference. On time-to-time basis, minimum wages (published) shall be checked, to ensure that there is no case of non-compliance. Further, while estimating requirement, shift wise requirement shall be worked out.

3 Payment terms, Incentives and Penalties



The price bid formats continue to be divided into two schedules viz. Schedule A & B. Schedule A includes items and materials provided by GWSSB at the mentioned rates whereas, Schedule B covers amounts

payable to the agency for the included scope of services. The schedules are illustrated in the image below.

As can be seen in the figure, Schedule B is divided in 3 parts viz A, B, C as explained in the image.

3.1 Payments

As seen in the image, there are three parts to Schedule B. Part A is payable on monthly basis whereas part B & C are subject to completion of activities and approval of the measurement.

3.1.1 Part A: Routine O&M activities

Part A is for routine O&M activities and includes deployment of adequate manpower, supply of consumables, carrying out preventive maintenance, repair works and supply of potable drinking water to the beneficiaries.

Existing process: Earlier, payment for water supply to the villages was on pro-rate basis of the agreed rates. For example, there are 100 villages in the scheme, 20 of which are technical issue villages then only 80% payment was made to the agency without providing any baseline in the tender.

Revised process:

- ▶ **We have defined habitations as: a village or a town or a census hamlet directly connected with the RWSS under Faliya connectivity). For clarity, any mention of the word 'hamlet' or 'H' across the tender document shall mean census hamlets which receive water supply directly from the RWSS.**
- ▶ Actual baseline i.e. a list of villages, towns and direct hamlets (census) and their functionality status shall be provided in the tender document.
- ▶ Part A will be paid in full, i.e. quoted and approved Part A rates, if the contractor supplies water to the operational habitations and voluntary habitations (if demanded by such habitation).
- ▶ No deduction for not supplying water to the habitation with pre-existing technical issue. (Here, the logic is that during the tendering process, we had provided the baseline and the agency has quoted accordingly). If the operational habitation does not receive water supply, then penalty provision has been made.
- ▶ **If the scheme comprises of faliya connectivity (census hamlets), then such hamlets are to be treated as village.** The baseline shall also include operational status of such census hamlets receiving water directly from RWSS.

For example,

Baseline- Category	no. of V+C+H	Actual supplied No. (all days of the month)
Operational	100	100
Voluntary	15	2
Technical	20	0
Total	135	102
Approved quote: Part A per month		Rs 20,00,000
Payable amount for Part A		Rs 20,00,000

- ▶ In the above case, the contractor supplies water to all operational habitations in the established baseline as per target quantity. In addition, 2 voluntary habitations also demanded water supply from GWSSB. Then the agency will receive full payment against the quoted Part A for that month. A necessary condition here is that all operational habitations should have received the target quantity (or LPCD).
- ▶ Further, it is noticeable that there were 20 technical habitations in the baseline and none of them received water during the month. In such cases, no deduction or penalty will be levied.
- ▶ Also refer to the incentive guideline, to check necessary steps in establishing base guidelines and revising it during the contract period.

3.1.2 Part B: Payable Maintenance activities

Activities such as cleaning of all storage structures, internal and external painting works and replacement of

filter media in filter bed are measurable and payable separately under this part. Important point to take care: tendering officer must consider the total number of times such activities are to be done during the contract period. For e.g. internal and external painting needs to be done twice in the 60 months period. Such frequency shall be considered while preparing estimates.

GWSSB's tendering authority is required to provide estimated quantity of such items in the tender document.

3.1.3 Part C: Legacy non-functional assets

Need: A lot of RWSS or its assets are defunct currently due to reasons attributable to previous O&M agencies. The primary reasons for this situation may be:

- ▶ When such issue is attributable to a fault of the O&M agency
- ▶ In some cases, a dispute/ lack of clarity in deciding the responsibility of repair has resulted in such non-functional asset
- ▶ It is also observed that due to poor design or construction, some assets have ceased operations.
- ▶ Lack of ownership, or attitude to carry out business as usual

Process:

- ▶ This added part C will enable GWSSB to repair defunct assets or solve technical issues due to which water supply is affected.
- ▶ Deputy Executive Engineer will conduct a baseline assessment of the scheme 2 months prior to the end of existing contract.
- ▶ Through this, the DEE will identify assets which are not functioning properly along with a list of habitations (operational, voluntary and technical)
- ▶ DEE and the Executive engineer will decide if the issue is attributable to a O&M agency's fault or not.
- ▶ If due to agency's fault, the agency will be given a notice to repair the asset or recovery will be made from his monthly bill or performance security.
- ▶ If not due to the agency, then the DEE will prepare a list of items to be executed along with the cost estimates and take approval from the concerned authority as per the Delegation of Powers matrix. The assessment checklist shall be certified by Executive Engineer.
- ▶ Post receipt of such approval, BOQ of such repair works shall be added in the Part C of volume II. This will be executed by the successful bidder or selected O&M agency.

Important considerations:

The cost of Part C shall not exceed 30% of the total cost estimate (i.e. Part A+ Part B) of the tender. Some materials may be provided by GWSSB under Schedule A of Price Bid.

3.2 Incentives

To resolve the technical issues due to which some village/ town/ hamlet is not receiving water, we have made two types of provisions. First, through the use of Part C or second, by incentive mechanism in the contract.

What is the provision?

We will provide a one-time incentive per habitation, if the agency solves the technical issue and resumes water supply in baseline technical habitation/s.

How does it work?

- ▶ If a habitation was identified as a "technical issue" habitation in the tender baseline.
- ▶ The agency identifies the issue and solves it through repair work or replacing any damaged part.
- ▶ Agency will receive a one-time incentive in the following month's billing cycle.

How much is the incentive?

The incentive ranges from 10% to 50% of the annual rate per habitation (part A). It should be noted that no other payment shall be made towards the cost of repair or replacement taken up by the agency for solving

the technical issue. Agency will receive only a one-time incentive.

Let us see an example for calculation:

Say there are 135 habitations in the contract as shown below: (all figures are only for illustration)

Category	Operational	Voluntary	Technical	Total
No. of V+C	100	15	20	135

Part-A which are a monthly rate for O&M for year 1 to year 5 and are agreed upon are as follows:

Year	Part A per month	Part A per annum	Annual rate per habitation (Part A per annum/ total V+C)
Year-1	2,000,000	24,000,000	177,778
Year-2	2,120,000	25,440,000	188,444
Year-3	2,247,200	26,966,400	199,751
Year-4	2,382,032	28,584,384	211,736
Year-5	2,524,954	30,299,447	224,440

Now if the agency solves technical issue during its contract period, then GWSSB will pay one-time incentive as follows:

Year	Annual rate per habitation	Incentive formula	Habitations operationalized	Incentive per habitation	Total incentive
A	B	C	D	E= B x C	F = D x E
Year-1	177,778	50%	4	88,889	355,556
Year-2	188,444	40%	2	75,378	150,756
Year-3	199,751	30%	3	59,925	179,776
Year-4	211,736	20%	1	42,347	42,347
Year-5 (First 6 months)	224,440	10%	1	22,444	22,444
Year-5 (Last 6 months)	224,440	0%	0	0	0
Total operationalized habitations			11	Incentives Total	750,878

Any Exclusions or considerations?

There are some exceptions under which the agency shall not be paid the incentive. They are:

- ▶ If the technical issue has been resolved due to the items in Part C of the tender.
- ▶ If the habitation was not identified as “technical issue habitation” in the baseline
- ▶ For a habitation which encountered technical issue during the contract period and later solved by the agency within the same contract period.
- ▶ No additional pro-rate payment (monthly) will be paid for such habitation with restored water supply.
- ▶ When the technical issue has been resolved and water supply resumes, the incentive will be payable after 3 months trial period. During this trial period, no penalties will apply.

Impact on baseline

Once a technical issue habitation has been operationalized and water supply has been restored, such habitation/s will be added in the “operational” category in baseline. This will be the new baseline. Now this new operational habitation will attract penalties for non-supply or less supply.

3.3 Penalties

Penalties are categorized into 4 types as below:

- 1) **Operational:** To ensure service delivery and compliance to the service level agreement (SLA). This includes coverage of water supply, quantity of water supply, manpower deployment, water quality, conduct of operator’s staff, safety and reporting.
- 2) **Preventive Maintenance:** This will ensure timely completion scheduled maintenance activities such as daily, monthly, quarterly and annual maintenance. Additionally, this will also include calibration,

servicing, overhaul, weather specific activities.

- 3) **Repairs and Emergency Response:** The objective of this penalty is to ensure that any breakdown is addressed in a timely manner.
- 4) **Other miscellaneous:** This is aimed to ensure compliance of statutory requirements. Additionally, it was observed that some agencies do not submit monthly bill on timely basis (sometimes delayed by 6 months or a year), hence a penalty to discourage late bill submission has been introduced.

3.3.1 Operational Penalties

The Board has considered a 2- day block period for evaluation of non-compliance cases against Service Level Agreement. This means, that the agency should compensate for any shortfall quantity on the following day to avoid penalties.

E.g. A habitation has 1 MLD water demand. Due to some issue, only 0.5 MLD water was supplied on say 20th day of the month. The agency supplies 1.5 MLD on 21st of the month. No penalties or deduction will be made against the agency.

To understand each case under Operational penalties (i.e. a(i), a(ii), b and c), a detailed example is given below:

There are 150 V+C in the scheme (95 operational). Out of this, some data for 10 V+C is to be evaluated. Assume the following 9 habitations and 1 city with the mentioned daily water demand (target) in MLD.

Village/City/ hamlet	Village 1	Village 2	Village 3	Village 4	Village 5	Village 6	Village 7	Village 8	Village 9	City 1
Demand (MLD)	0.80	0.30	0.70	0.35	0.55	0.30	0.43	0.60	0.20	4.20

The water supply record sheet is as below:

S.No	ID	Name	Category	Current status	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7	Day-8	Day-9	Day-10	Day-11	Day-12	Day-13	Day-14	Day-15	Day-16	Day-17	Day-18	Day-19	Day-20	Day-21	Day-22	Day-23	Day-24	Day-25	Day-26	Day-27	Day-28	Day-29	Day-30
1	12345	Village 1	Village	Operational	0.81	0.81	0.82	0.81	0.81	0.82	0.81	0.83	0.83	0.75	0.70	0.70	0.60	0.60	0.63	0.25	0.25	0.25	0.25	0.81	0.81	0.82	0.81	0.81	0.82	0.81	0.83	0.83	0.83	0.83
2	12346	Village 2	Village	Technical	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	12347	Village 3	Village	Voluntary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.7	0.7	0.7	0.3	0.3	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
4	12348	Village 4	Village	Operational	0.35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
5	12349	Village 5	Village	Technical	0	0	0	0	0	0	0	0	0	0.55	0.55	0.56	0.56	0.56	0.58	0.58	0.56	0.57	0.58	0.56	0.56	0.25	0.25	0.57	0.57	0.58	0.56	0.56	0.58	0.58
6	12350	Village 6	Village	Voluntary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	12351	Village 7	Village	Operational	0.44	0.43	0.43	0.44	0	0	0	0	0	0	0.44	0.43	0.43	0.43	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.43
8	12352	Village 8	Village	Operational	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
9	12353	Village 9	Village	Operational	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.21	0.18	0.22	0.1	0.2	0.21	0.2	0.21	0.21
10	12354	City 1	City	Operational	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5

Other considerations:

- ▶ Village 2 and 5 are not receiving water due to technical issue and are identified in the baseline.
- ▶ Village 5's technical issue has been resolved and supply has started from Day-10.
- ▶ Part A for current (first) year is Rs 2.4 Cr. Hence, per month billable Part A is Rs 20 Lakhs. The rate per habitation is as below:

	Part A per operational habitation
Annual (for penalty)	(2.4 Cr/ 95 habitations) =252,632
Annual (for incentive)	(2.4 Cr/ 150 habitations) =160,000
Monthly	(20 Lakh/95 habitations) =21,053
Per day	{2.4 Cr/ (365x95 habitations)} =692

Let us see how the instances are worked out for non-compliances:

Applicable incentive or penalty	Village 1	Village 2	Village 3	Village 4	Village 5	Village 6	Village 7	Village 8	Village 9	City 1	Total
Explanation	>90% on 10-11 hence no issue 50% to <90% on 12-13 and 14-15 0 to <50%: 16-17 and 18-19	Since it is a technical village: no case applicable	Voluntary village but less than 50% on 21-22	>50% on 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, 100% on 14-15	Technical village to operational village <50% on 22-23	no demand from voluntary village	0 supply on 5-6, 7- 8, 9-10, 16-17, 18-19, 20-21, 22-23, 24-25, 26-27 >50% on 28-29	Compliant	No supply from 1-20 Less supply on 23-24, 25-26 (here, only the larger penalty is applicable)	>50% but less than 90% supply throughout	
a (i): 0 to 50% (2-day) - No payment for 2 days (or the block)	2		1		1						4
a (ii): 50% to 90% (2-day) - 70% payment for 2 days	2			6			1			15	24
b: no supply for 6 continuous days (3 x 2-day) - No payment for 6 days - 50% penalty (6 days x 50%)							3				3
c: no supply for 20 continuous days - No payment for the month - 100% penalty (monthly fee)									1		1
One-time incentive (first year) (after 3 months' trial period)					1						1

Each instance of non-compliance has been explained in the above table. Now let's look at the calculations for deductions.

Particulars	Instances	Rate per instance	Total Amount
Part A fees per month			2,000,000
a (i): 0 to 50% (2-day) - No payment for 2 days (or the block)	4	2 x 692	Less (4x2x692) = -5,536
a (ii): 50% to 90% (2-day) - 70% payment for 2 days	24	2 x 692 x 30%	Less (24x 2x 692x 0.3) = -9,965
b: no supply for 6 continuous days (3 x 2-day) - No payment for 6 days - 50% penalty (6 days x 50%)	3	6 x 692 x 150%	Less (3x6x692x1.5) = -18,684
c: no supply for 20 continuous days - No payment for the month - 100% penalty (monthly fee)	1	21053 x 200%	Less (1x21,053x2) = - 42,106
One-time incentive (first year) (after 3 months' trial period)	1	252632 x 50%	Add (1x1,60,000x0.5)= +80,000
Total Part-A Payable after deductions and incentives			2,003,709

Hence, a total of Rs 76,291 will be deducted from Monthly Part A. Additionally, one- time incentive of Rs 80,000 is payable.

3.3.2 Maintenance Penalties

This are designed to encourage timely completion of schedule maintenance activities. A framework schedule for carrying out maintenance is provided at the start of Annexure VII in model tender. Example, yearly maintenance activities: Between 15th and 30th of January of every year. If not completed within such stipulated time, then penalty must be levied in the billing cycle.

3.3.3 Curative maintenance (repairs & emergency response)

In cases of breakdown where repair or replacement will be required, it has to be completed within the first 24 hours. Further, water supply shall not be affected.

- ▶ For delay of >24 hours to ≤ 48 hours: Penalty will be Rs 1000.
- ▶ For delay of >48 hours: Penalty will be Rs 10000/day.

For example: A contractor has attended a breakdown and took 98 hours to resolve, then penalty will be as below:

Sl. No.	Time Period	Penalty (Rs)
1	0 to 24 hours	0
2	24 hours to 48 hours	1,000
3	48 hours to 72 hours	10,000
4	72 hours to 96 hours	10,000
5	96 hours to 98 hours	0
Total		21,000

4 Maintenance Activities

Based on the periodicity, preventive maintenance activities are categorized as follows:

- ▶ Daily Checklist: Observation based actions. Only if found not ok, troubleshoot or take remedial action
- ▶ Monthly Maintenance Checklist: For each equipment/ asset.
- ▶ Quarterly Maintenance Checklist: For each equipment/ asset
- ▶ Annual Maintenance Checklist: For each equipment/ asset (including calibration, servicing etc)
- ▶ Overhaul Checklist: For pumps, bridge, filter plant
- ▶ Weather specific activity log: Summer & Monsoon preparation

Periodicity	Total checklists
Daily	(365 days x 5 years) x number of assets
Monthly	(12 months x 5 years) x number of assets
Quarterly	(4 quarters x 5 years) x number of assets
Annually (incl calibration, servicing, performance testing)	(5 years) x number of assets
Overhaul	As per frequency

Board may decide to provide printed booklets for the same to the agency or ask the agency to prepare such booklets.

These checklists are created for following assets:

- ▶ Pump & motor set
- ▶ Panels, Circuit Breakers, Starters
- ▶ Transformer & Substation
- ▶ Headworks (with Filter Plant)
- ▶ Valves & Gates
- ▶ Flowmeters

5 Other important provisions

This includes review meetings, training programs, uniform and ID cards for staff. These provisions shall be followed mandatorily and shall be complied to.

6 Asset & Inventory Survey

Deputy Executive Engineer shall conduct a survey 2 months prior to completion of existing O&M contract. The survey shall cover all components of the scheme/s including intake/offtake structure, pipeline networks, filter plant, electromechanical components, storage structures etc. The following outputs are desired from the survey;

- Asset list & specifications, operational condition, required corrective actions
- List of villages, hamlets & cities covered by the scheme including their status: operational, technical, voluntary etc.
- Identify reasons/ technical issue for non-operational habitations & responsibility

The survey report shall be countersigned by Executive Engineer. A copy shall be shared with the existing O&M agency and a scan shall be attached in the DTP for O&M. The survey report shall clearly indicate issues for which existing agency is responsible and take corrective actions. Further, issues not attributable to existing agency can be taken up in Part C of Schedule B Volume II. All such issues shall be examined and items related to resolution of such issues shall be added in the Part C. Provide findings of this survey in Annexure I & IX of the DTP volume-I.

7 Estimation of cost

Sl. No.	Part	Estimation Remark
1	Part A: Operation & Maintenance	<ul style="list-style-type: none"> ► Establishment & vehicle cost ► Maintenance & Repair cost as % of capex cost
2	Part B: Maintenance paid separately	Cost of items as per SOR and frequency <ul style="list-style-type: none"> ► Painting ► Replacement of filter media ► Cleaning of water storage structures
3	Part C: Repair of non-functional components	BOQ as per SOR, Market survey etc.

For establishment cost, below reference rates may be used:

Sr. No.	Qty.	Unit	Item	Rate per month (in Rs.)	Per	Total Amount in Rs.
1	2	3	3	4	6	7
1	[##]	Persons	O&M Manager (7 YoE)	60,000	person	
2	[##]	Persons	Maintenance Engineer (5 YoE)	50,000	person	
3	[##]	Persons	Asst. Maintenance Engineer (1 YoE)	22,000	person	
4	[##]	Persons	Operators (1 YoE)	15,000	person	
5	[##]	Persons	SCADA Operator (1 YoE)	17,000	person	
6	[##]	Persons	Electrician (3 YoE)	17,000	person	
7	[##]	Persons	Lab in charge/ Chemist (1 YoE)	20,000	person	
8	[##]	Persons	Pipe Fitter/ Valve man (0.5 YoE)	15,000	person	
9	[##]	Persons	Data Entry Operator	15,000	person	
10	[##]	Persons	Helpers for fitter/ operator/ laboratory	12,000	person	
11	[##]	Persons	Sweeper	12,000	person	

Sr. No.	Qty.	Unit	Item	Rate per month (in Rs.)	Per	Total Amount in Rs.
12	[##]	Persons	Outdoor campus maintainer	12,000	person	
Total Manpower Cost for all required personnel for <u>one month</u>						
13	[##]	No.	Utility vehicle (4-seater pickup) AC or Non AC	As per EM SOR Section C Item 10	Nos.	

Important Notes:

- 1) While estimating O&M cost, a 6% escalation per annum shall be considered for year 2 to 5. For e.g if total O&M estimate in Part A & B for year 1 is INR 2 Crores, then after escalation, the estimates will be Year-1= 2,00,00,000, Year-2= 2,12,00,000, Year-3= 2,24,72,000, Year-4= 2,38,20,320 and Year-5= 2,52,49,539.