ADOPTING INTEGRATED URBAN WATER MANAGEMENT IN INDIAN CITIES (AdoptIUWM)

Tender document for Pilot Project on
Use of abandoned bore wells/ hand pumps for recharge in one ward
Neelam Nagar, Solapur

Terms of Reference for Recharge of Abandoned Bore Wells/ Hand Pumps for Recharge in Neelam Nagar Area of Solapur

Pilot Project title
Recharge of abandoned bore wells/ hand pumps for recharge in Neelam Nagar Area of Solapur

Section 1: Background to AdoptIUWM Project
ICLEI South Asia in partnership with ICLEI European Secretariat and Association of Belgian Cities and Municipalities (VVSG) is implementing the European Commission funded Project on Adopting Integrated Urban Water Management in Indian Cities (AdoptIUWM) in 2 cities of Rajasthan (Kishangarh and Jaisalmer) and 2 cities of Maharashtra (Solapur and Ichalkaranji) for capacity building of cities towards closing the urban water loop by managing water, wastewater and storm water as part of the same cycle (interactions of waste with water are also being looked into).

Section 2: Background to Neelam Nagar
Neelam Nagar area is largely characterized by industrial worker population (daily wage workers) living in tin sheds made on private land. The area located on the periphery of Solapur city is a rapidly expanding pocket of urban poor. This area is not covered by Municipal water supply or drainage network. The only sources of supply to the area are: the Municipal water tankers (supplied once in 4 days) free of charge (some token payments are informally exchanged between residents and tanker suppliers); and the hand pumps/bore wells in the area. The bore wells are fast drying out due to rapid expansion of the urban pocket and increased water abstraction and are used by the residents for secondary purposes. The tanker supply water is used for drinking purposes. Other than this, the residents also store runoff from roofs in water cans during monsoons.

Neelam Nagar is located close to MIDC industrial area and a lot of textile industry units are located close to the slum discharging polluted wastewater into the 2 nallahs running through the site (East nallah and West nallah). Both nallahs drain into Hotagi Lake.

Since Neelam Nagar area has large percentage of daily wage industrial workers, the area has a very low coverage of individual household toilets and provision of community toilets is also not feasible due to paucity of land. Hence, open defecation is common in the catchment area. After consultations with ICLEI, Municipal Corporation has facilitated enrolment of households under Swachh Bharat Mission and land ownership registration process in Neelam Nagar. The area also has 2 brick kilns. Due to industrial pollution, brick kilns and open defecation, surface runoff recharge for the site is not possible and roof top recharge would be given primary importance.

Additional details are provided in Annexure 5

Section 3: Selected sites in Neelam Nagar and description of sites
Based on surveys by Consultants and stakeholder consultations, 3 sites have been shortlisted for roof top harvesting

1. **Existing and abandoned bore well near Ashram**
The Ashram building has a central court, a functional bore and an abandoned bore behind the building. Estimated roof top area for the Ashram is 587 sqm. Estimated runoff of 280 cum (after initial filtration using a rainfall filter) needs to be collected and provided with a filtration unit and recharged using the existing and/or abandoned bore.

Estimated runoff: 280 cum

2. **Pocket in EWS housing in Bidi Gharkul near Neelam Nagar**
An EWS housing pocket of nearly 120 Dwelling Units faces extreme shortage of water. The remaining residents are resorting to water proofing of roofs and blocking the drainage pipe to store rain water on roofs of houses. A pocket for recharge has been selected in this area comprising of 8 dwelling units which would be provided with roof top harvesting connecting to individual household filters and then the runoff would be used to recharge a bore well located near the housing block.

Estimated runoff: 250 cum

3. **Hand pump near Temple**
The semi pukka houses near Temple face extreme water scarcity and drying up of bore wells/hand pumps is common. The site has 4 hand pumps and each year a new bore well is drilled as the previous one dries out completely or during summers. A series of 4 hand pumps or bore wells exists in one row where one hand pump is completely dry, one is seasonally dry and the other two are functional with fluctuating water availability. The roof tops near the Temple have to be provided with half round gutters (most of these roof tops are made of tin sheds) and the runoff is to filtered and the collected runoff is to be diverted to underground pipes which will open into a recharge pit connected to the hand pump for recharge.

Additional details are provided in Annexure 5
Estimated runoff: 980 cum
Total estimated runoff potential = 1500 cum approx.

Section 4: Site considerations (Rainfall, geology)
Average annual rainfall: Varies between 543 to 859mm (Average 700mm)
Geology: Basalt rock (Deccan Trap) of volcanic origin comprising of 2 distinct horizons: massive and vesicular basalt

Section 5: Key tasks required to be completed by the Contractor
1. **Household or plot level interventions**
   - Provision of roof top gutters for Ashram, EWS housing unit and houses near temple
   - Provision of rainfall filters and individual connection to each household/plot from the rainfall filter (for Ashram and EWS housing)
2. **Construction of Collection and filtration systems**
   - From the roof tops, the runoff would be collected using PVC pipes to carry runoff to collection unit to be provided for all 3 sites
   - From these collection units, runoff would be taken to a filtration chamber cum rain water harvesting pit (to be provided for all 3 sites)
   - This filtration unit cum rain water harvesting pit would be connected to the bore well/hand pump for recharge
3. **Operation and maintenance**
   - Operation and maintenance plan for the structure along with annual costing would be provided by the Contractor
   - Contractor would be responsible for successful functioning of the system and structures created under the project for a duration of at least 6 months after completion of project
4. **Permissions and Utilization Certificate for the constructed systems**
   - All requisite permissions from Authorities are to be undertaken by the Contractor. ICLEI South Asia would facilitate the same.
   - Contractor would be required to procure a Utilization Certificate for completion of the project to the satisfaction of ICLEI South Asia and Municipal Corporation. All the labour and material costs are to be borne by the Contractor and all works should be executed to high level of engineering and to the satisfaction of ICLEI South Asia.

Section 6: Layout of structures on Site
Annex 1

Section 7: Design specifications
Annex 2

Section 8: Other key specifications
Annex 3

Section 9: Eligibility Criteria
Organizations or individuals can bid for this contract. The following conditions are required for eligibility for this project (at least 2 of the following):
1. Minimum 5 years of experience in implementing similar projects on rain water harvesting
2. Contractor should have successfully completed work on rain water harvesting or borewell drilling in the last 3 years and Contractor should furnish the self-attested copy of work orders for these works and/or a copy of certificates for satisfactory construction of bores from the same Institution
3. Minimum turnover of Rs. 15 lakh during last 3 years would be required in case of organizations and minimum of 3 Utilization Certificates or other completion documents/work orders for projects exceeding 5 lakh rupees (for last 3 years) each would be required in case of individuals

Section 10: Details required in contract document
**Technical Bid**
1. Credentials of organization and or individual
2. CV of personnel to be involved in the project and committed mandays. The CVs once submitted cannot be changed without prior permission of ICLEI South Asia in writing
3. Details of at least 3 similar previous projects implemented by the organization/individual showing pre and post project impacts
4. List of permissions/registrations that would be required for the project
5. Timelines for implementation (construction is to be completed within a maximum of 2 months from the day of award of project, O&M (Operation and maintenance) of project for at least 6 month after completion; weekly schedule of implementation activities should be submitted with the bid document)

6. Methodology for community engagement and training of community in O&M of structures created

7. Measures required for O&M post implementation

8. Experience of working in the State or city would be an additional benefit

Financial bid
1. Financial bid for tasks listed in the bid document and Annexure 1, 2 and 3. The total cost should include implementation costs and costs for 6 months O&M of the structure and systems created
2. Item wise break up for all 3 sites (in accordance with Annex 3)
3. Financial Audit or Income Tax report for at least one year, preferably last 3 years

Note: All Technical and Financial bids should preferably be in English. The financial bid should be in accordance with the State government Schedule of Rates.

Soft copy of the tender document (technical and financial) should be mailed to ICLEI South Asia on the details mentioned in this contract.

Section 11: Ernest Money Deposit
The selected Contractor would be required to submit Ernest Money Deposit worth 5% of the total tender cost finalized with ICLEI South Asia (after negotiations). This amount would be deposited as security of bank guarantee from Nationalized bank and the selected Contractor shall have to sign a contract with ICLEI South Asia within 15 days of award of project. Upon successful completion of project, this amount would be added to the final payment made to the Contractor. The Ernest Money Deposit should be deposited by successful Contractor at the time of signing the Contractor through Demand Draft in favour of ICLEI South Asia, payable at New Delhi. Ernest Money Deposit should be valid for a duration of 8 months from the date of submission of bid.

Section 12: Terms of Payment

First instalment: 25% mobilization advance against Ernest Money Deposit (valid for 8 month period) and submission of:
- Report on findings of the geophysical survey
- Final technical report with costing estimates and detailing of designs and bill of quantities before initiation of implementation work

Second instalment: 30% against bills for purchase and delivery of all material on site and excavation of all recharge pits and collection units and connection of respective rooftops for all 3 sites to the collection pits after provision of rain water filters where specified.

Third instalment: 25% on completion of project and completion of following tasks and submission of reports:
- Training of community level and individual households in operation and maintenance of the system
- Construction of Rain water harvesting system at 3 sites in Neelam Nagar slum
  a. Ashram
  b. Near Temple
  c. EWS housing in Bidi Gharkul near Neelam Nagar
- Participation in Focus Group discussions, stakeholder workshops or other project workshops, as per requirement of ICLEI South Asia
- Final completion report for the project after completion of works (2 months from award of contract) giving all details of technical specifications and costing used for the project
- Reports for monitoring ground water levels before and after monsoons in the area to show results of recharge and monitor water quality of recharged runoff

Fourth instalment: 20% after 6 months of successful completion of the project and successful demonstration of impact of project on ground water recharge in the bore wells/hand pumps under consideration at the 3 sites in Neelam Nagar and completion of following tasks and submission of reports:
- Recharge of 3 borewells
- Successful functioning of the system for at least 3 to 6 months
- Closure report including O&M details for structure and reports for 6 month monitoring of the project

Section 13: Timelines
The Contractor would be required to complete the project activities within 2 months of award of contract and would be required to undertake Operation and Maintenance for the next 6 months as part of the contract. The Contractor is required to submit a weekly schedule of activities as part of the bid document. Any deviation of more than one week from the proposed schedule would invite penalties/termination in accordance with Section 21.
In case of any with cost extensions to the project to ICLEI South Asia by European Commission, the same shall be applicable to the contractor also. In case of any no cost extensions to the project to ICLEI South Asia by European Commission, the same shall be applicable to the Contractor for the same scope of work

Section 14: Operation and Maintenance
The contractor would be responsible for Operation and Maintenance of the facility for a period of 6 months after construction

Section 15: Labour and Material
1. All labour required for the completion of the task would be provided by the Contractor in accordance with the laws of the land
2. Any incidents that occur on site or with the labour during the course of the contract would be the liability of the Contractor alone. ICLEI South Asia and Solapur Municipal Corporation would not have any liability in such case
3. Any loss of material or accidents or loss of life during the course of the contract would be the sole responsibility of the Contractor.
4. Contractor has to make his own arrangement for power and water required for implementation work. In any circumstances water and water tanker or electricity supply or generator will not be accepted.
5. The Contractor shall maintain safety of workers on site and should provide the appropriate safety equipment and gears for the same. No additional costs for this can be charged to ICLEI South Asia
6. The Contractor should maintain an attendance register on site during implementation phase and ensure all workers mark their attendance and signature. This list can be checked at any time by ICLEI South Asia representative.
7. Drinking water, food and other requirements for the labour shall be provided by the Contractor.
8. The Compliance of the Safety and Health provisions are of utmost important to the Client. The Contractors must note that ICLEI South Asia will take a serious view of any noncompliance report of Safety norms and standards. ICLEI South Asia has a right to order stoppage of work till rectification is carried out for all safety norms and standards
9. Provision of First Aid Kit should be ensured on site during the entire implementation period by the Contractor
10. Information on Emergency contact numbers and details shall be provided to labour supervisor by the Contractor

Section 16: Complaint Redressal
1. The Contractor shall ensure that the work on site should be conducted such that no construction or other works lead to any disturbance or complaints from the residents of the area or Solapur Municipal Corporation or ICLEI South Asia
2. Any complaints arising during the implementation phase or during the 6 month operation and maintenance period after implementation would be the responsibility of the Contractor and ICLEI South Asia would not be liable to address these complaints.
3. In case of any complaints related to quality or timing or other aspects of the work or material used for the project (by residents of the area or Municipal Corporation or ICLEI South Asia), the Contractor shall be liable to address the same within 48 hours of the complaint being informed to the Contractor (verbally or in writing) at own cost. In case of failure to address complaints within the stipulated time, a written notice shall be sent to the Contractor by ICLEI South Asia to resolve the complaint within a period of one week. In case of noncompliance to meet the terms of the notice, the Contractor can be penalized or the contract can be terminated at ICLEI South Asia’s discretion in accordance with Section 21

Section 17: Quality of recharge and revival of bore wells/Hand pumps
1. The Contractor shall submit evidence (water quality testing reports) to certify that the runoff being recharged is safe and as per National standards. Testing for parameters listed in Annex 4 would be required to be undertaken by the Contractor once a month during monsoons. The reports for the same would be submitted to ICLEI South Asia and any noncompliance would have to be addressed by the Contractor.
2. In instances where due precautions and monthly monitoring any leakage or other external factors lead to polluted water infiltration from the structures built under the project, managing such instances (along with the cost required for preventive measures) and mitigation of related impacts shall be the liability of the Contractor. ICLEI South Asia shall not be liable for this or any legal implications arising out of such acts.
3. The Contractor shall monitor ground water level before and after recharge at all 3 points of recharge on a monthly basis and submit the report for the same at the end of 6 months.
4. Contractor should ensure that water quality testing and water table measurement are undertaken by per State/National government certified agencies in accordance with National standards.
5. The Contractor shall provide for adequate fittings and educate the stakeholders on removing first flush runoff
6. Any excavations required for implementation should be undertaken in consultation with ICLEI South Asia and Solapur Municipal Corporation to ensure that no foundations or pipes or existing groundwater flow paths are adversely impacted by the excavation.
Section 18: Quality Control

- Officials from ICLEI South Asia or Solapur Municipal Corporation would undertake regular inspection of the site work during implementation phase as well as during the 6 month Operation and Maintenance phase. The officials shall check the Contractor's work and notify the Contractor of any Defects that are found. The officials from ICLEI South Asia and/or Solapur Municipal Corporation can visit the site at any time for inspection without prior notice and can instruct the Contractor to search for a Defect and to uncover and test any work that the Official considers may have a defect.
- The Contractor shall permit the official(s) from ICLEI South Asia or Solapur Municipal Corporation to check the Contractor's work and notify the Contractor of any defects that are found.
- If the official instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a defect all such test/tests shall be carried out by the Contractor at his own cost and shall be deemed to be included in the rates given by Contractor.
- The official(s) from ICLEI South Asia and/or Solapur Municipal Corporation shall give notice to the Contractor informing him/her of any defects after or during implementation and/or Operation and Maintenance phase. Every time notice of a defect is given, the Contractor shall correct the notified Defect within the length of time specified by ICLEI South Asia in the Notice issued to the Contractor for defect correction. If the Contractor has not corrected a defect within the time specified in the notice, ICLEI South Asia will assess the cost of having the defect corrected, and the amount will be recovered from the Contractor.
- All material supplied or used for the project shall be in accordance with National Standards. Officials from ICLEI South Asia and/or Solapur Municipal Corporation can inspect the materials being used for the implementation work and any material found defective or below standards would have be to be replaced by the Contractor at own cost. ICLEI South Asia would not be liable to pay any costs of material/labour/transport/other for any below standard material used for implementation.
- In case a defective or below standard material is found by the officials from ICLEI South Asia and/or Solapur Municipal Corporation, the same shall be notified to the Contractor in writing and the Contractor would be required to replace the material within 15 days of letter of notification. In case of failure to replace the material, ICLEI South Asia reserves the right to stop implementation work on site and delays or termination in accordance with Section 21 would be charged.
- The Contractor cannot sublet the entire work or any subcomponent of the work unless agreed in writing with ICLEI South Asia. In case of subcontracting, the costs would have to be borne by the contractor and ICLEI South Asia shall not liable to pay any costs to the subcontractor. Management of the subcontractor would be the responsibility of the Contractor.
- Protection of works or material during construction period shall be the sole responsibility of the Contractor. ICLEI South Asia shall not be liable to any damage/claim arising from this.
- The Contractor shall ensure that all pipes laid underground have the required load bearing capacity and the surface above the pipes is filled and finished smoothly on ground. For above ground pipes, the Contractor shall ensure that the pipes used are sturdy and would not be susceptible to break down under regular weather conditions.
- The Contractor should ensure that pipes donot lead to any leakages. In case of leakages detected during implementation or during O&M phase, the Contractor shall permanently fix these leakages at own cost.
- The Contractor shall train the stakeholders in maintenance of individual and community level systems and structures created to ensure regular O&M post withdrawal of support.
- The material waste from excavations shall be used or disposed of by the contractor in accordance with the standards.
- The Contractor should ensure that waste piles for more than one week are not maintained on site.
- All material purchased by the Contractor as part of the contract shall be new and of first quality according to the specifications and shall be free from defects (Including concealed fault, deficiency in design, material and workmanship). The Contractor shall take approval (on quality of material) from representative from ICLEI South Asia or Solapur Municipal Corporation at the time of delivery of material on site or at the time of use for construction or other works on site. Materials replaced / repaired under guarantee / warrantee period shall have further warranty for a period of 12 months from the date of repair / replacement.

Section 19: Variations during implementation

If during implementation, the Contractor and ICLEI South Asia deem it necessary to undertake any task or implement any works that were not envisaged at the time of contract signing but are crucial for successful implementation of the Contract and it has been verified that the Contractor did not intentionally hide such a requirement or the task is not arising due to incompetence or inexperience of the contractor, then in such cases, an amendment to the Contract would be required for the project as an annexure. The costing for this additional task shall be as per the item wise costs quoted.
by the Contractor at the time of bidding and the total amount of such variation cannot exceed 20% of the total Contract value.

Section 20: Extension
Any extensions to the contract can only be entertained if approved by ICLEI South Asia in writing. In such cases, the financial bid for the contract shall remain unchanged. No additional payments would be entertained for the extension period.

Section 21: Penalty and Termination of Contract
1. Failing the delivery schedule mentioned in the contract document, a penalty at the rate of 1% (of the total tender cost) per week with maximum ceiling of 10% will be charged for non-completion of the work in prescribed time limit. If the work is not completed during this penalty period, then contract will be terminated, security deposit will be forfeited and Contractor can be blacklisted.
2. In case of termination of Contract, the Contractor shall be paid on pro-rata basis for the services successfully delivered to the satisfaction of ICLEI South Asia till the time of termination of Contract.

Section 22: Dispute Resolution
In case of conflict, both parties shall use their best endeavours to settle any dispute or claim arising out of or relating to the Contract and their attachments thereto through amicable discussions. If not amicably settled within sixty (60) days of the dispute or claim arising, the decision of ICLEI South Asia would be considered binding. In case the Contractor has objections to the decision of ICLEI South Asia, the dispute would be decided by a panel of three (3) external Arbitrators chosen mutually by ICLEI South Asia and the Contractor. The parties agree that the decision of the majority of the Arbitrators so appointed shall be final and binding upon the parties.

Section 23: Corrupt or Fraudulent Practices
1. ICLEI South Asia expects the Contractors to observe the highest standard of ethics and integrity during the procurement and execution of such Contracts.
2. If any bidder, even after selection, is found to indulge in malpractices or is found to have submitted false information at the time of submitting the bid or the quality of work is not found satisfactory by ICLEI South Asia, such Contractor can be disqualified by ICLEI South Asia after giving a written notice. If the Contractor fails to produce justification to the satisfaction of ICLEI South Asia or continues with the malpractices, ICLEI South Asia can terminate such a Contract at any time without giving prior notice.

Section 24: Bid Validity
All bids submitted shall remain valid for a period of 60 days from the time of submission. Any bids submitted for a lesser duration can be disqualified.

Section 25: Deliverables
- Construction of Rain water harvesting system at 3 sites in Neelam Nagar slum
  a. Ashram
  b. Near Temple
  c. EWS housing in Bidi Gharkul near Neelam Nagar
- Training of community level and individual households in operation and maintenance of the system
- Successful functioning of the system for at least 3 to 6 months
- Participation in Focus Group discussions, stakeholder workshops or other project workshops, as per requirement of ICLEI South Asia
- Total bore wells to be recharged: 3 nos (minimum)
- Reporting: The contractor shall submit the following reports to ICLEI South Asia
  a. Report on findings of the geophysical survey
  b. Final technical report with costing estimates and detailing of designs and bill of quantities before initiation of implementation work
  c. Final completion report for the project after completion of works (2 months from award of contract) giving all details of technical specifications and costing used for the project
  d. Reports for monitoring ground water levels before and after monsoons in the area to show results of recharge and monitor water quality of recharged runoff
  e. Closure report including O&M details for structure and reports for 6 months monitoring of the project
Section 26: Force Majeure
Contractor would take all necessary steps to ensure prompt delivery. They would not, however, be held responsible for any delays due to circumstances beyond control. ICLEI SA would not have any liability in case of circumstances beyond control arising from natural disasters or man made disasters or act of God.

Section 27: Duration of Tender
This tender would remain open for a duration of 15 days from the day of issue. Interests sent by the Contractors would be evaluated on the basis of Technical Proposal (50%) and financial proposal (50%). The shortlisted Contractor(s) (one or two maximum) would be interviewed and would be required to give a presentation to the Municipality (costs of this meeting are to be borne by the Contractor). After approval of Municipality, the Contractor would be finalized.

Section 28: Notification of successful Consultant
The bid shall remain open for a total of 15 days from the day of floating the tender. Successful Consultants would be notified latest by June 17, 2016.

Section 29: Additional Information
- Minor changes might be made to the proposed designs based on actual implementation planning and would be discussed with the selected Contractor before finalization
- ICLEI South Asia has the authority to call of this tender or make any changes or amendments to the contents of this tender in part or full, at any time, without giving any reason. The tenderers shall have no cause for objection or claim or action against ICLEI South Asia or Solapur Municipal Corporation for not selecting their tender.
- Sales Tax, VAT/TIN/PAN registration number should be mentioned in the tender document and the bills/invoices raised after selection
- The Contractor would have to raise an invoice for payment at each stage along with the required supporting documents
- Financial bid quoted by the Contractor shall be inclusive of all taxes and additional costs. No other costs, than those mentioned in the contract shall be entertained unless agreed mutually between ICLEI South Asia and the Contractor.
- All costs of transportation of material to the site are to be borne by the Contractor. No additional payments shall be made for this
- The total cost of tender and item rates for the contract shall be fixed for the entire duration of the contract and no changes to the same shall be entertained at any cost
- ICLEI South Asia might enter into negotiations on the financial bid with the shortlisted Contractor(s)
- The Contractor and/or any staff or subcontractor associated with the Contractor can be liable to audit or check by staff from European Commission and Contractor and all such staff or subcontractors shall cooperate in case of such audits or site visits by European Commission.

Section 30: Contact person
Ms. Meesha Tandon, Senior Manager, Sustainability Management, ICLEI South Asia, Email: meesha.tandon@iclei.org
Address: ICLEI South Asia, NSIC Complex, Okhla Industrial Estate, New Delhi 110020
Tel: 91 11 4106 7220
Fax: 91 11 4106 7221
Annexure 1: Location of Neelam Nagar and the 3 sites in Neelam Nagar

Exiting hand pump at Ashram (two bore wells also exist at the site)

EWS Colony
Bore well near temple
Pipe network in Ashram area

Pipe network in Temple area
Annexure 2: Design specifications

FILTRATION UNIT

- PVC PIPE 100 mm Ø / 90 mm Ø
- 0.5 m THICK WALL
- 0.23 m THICK WALL
- EXISTING WELL

PLAN

- 7 cm THICK DETACHABLE SLABS
- SLOTTED WALL
- DEPTH OF PIPE
- FIBRE BOARD

SECTION A-A

- 100 Ø PVC UNDER GRAVEL PACK IN 0.30 X 0.30 PIT
- HDPE JALI 0.3m X 0.3m
- P.C.C. 0.15m

FILTRATION UNIT DETAILS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L(m)</td>
<td>B(m)</td>
</tr>
<tr>
<td>1</td>
<td>ASHRAM AREA</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>TEMPLE AREA</td>
<td>3.5</td>
</tr>
<tr>
<td>3</td>
<td>KUMTHE</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Engineering drawing of filtration unit
Engineering drawing of collection chamber before filtration unit
### Annexure 3: Other key specifications

**Financial Estimates**

Contractor is requested to provide quote for material and services required for implementation of the following works. The Contractor should note that the tasks listed can change subject to the findings of the Geophysical survey conducted by the Contractor, after approval from ICLEI South Asia in writing. The total cost of Contract, however, shall remain the same and no changes shall be made to the cost of contract. Please note that all works are to be read in conjunction with the bid document and the annexure documents.

1. **Geophysical survey: Rs. 20,000**
2. **Temple site**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Additional details</th>
<th>Estimate by Contractor (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Provision and fixing of half round gutters in individual dwelling units around the bore well/hand pump covering a roof top area of 2000 sqft. Provision of tap to drain out first flush should be provided at the level of each household</td>
<td>180mm x 55 rmt</td>
<td></td>
</tr>
<tr>
<td>2 Connection of half round gutters to PVC pipes leading to the collection unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Excavation of at least 30cm below ground for pipes from individual dwellings over roads and pathways and provision of high strength pipes to carry runoff from individual households to collection unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Provision of HDPE tank/masonry based collection unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Construction of filtration cum rain water harvesting unit as per specifications in the drawing to recharge existing hand pump/bore well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Earth work in excavation below existing level in rain water harvesting pits etc. Including shoring, strutting, dressing sides (where required) and levelling, grading, ramming and bailing or pumping out water from the excavated areas collected from any source including sub soil water and keeping the excavated surface dry for subsequent works including taking out the excavated soil spreading in layers and stacking as directed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Providing and constructing Brick masonry as per drawings in cement mortar 1:5 mix (1 cement: 5 coarse sand). With bricks of class designation 75 and thickness specified at all heights and levels in foundations, etc as per drawing and details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Providing and laying in position plain cement concrete of specified grade including the cost of centring and shuttering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Providing and applying M25 Grade R.C.C slab to cover the well at top including necessary reinforcement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Providing &amp; laying 15 mm thick cement plaster to walls in cement mortar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Providing and filling with Sand (1-2 mm) in recharge pit, including watering, ramming and consolidation, dressing complete.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Providing and filling with Gravel in 4 layers (3 to 6 mm, 12 to 25mm, 25 to 50mm, 50 to 65mm) in recharge pit, including watering, ramming and consolidation, dressing complete, as per drawing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Providing and fixing uPVC pipes type –A conforming to IS 13592 for rain water pipes including all fittings, rubber ring type (plain or with access door) e.g. bends, junctions, cowl, offsets, access pieces, jointing with rubber ring joints with lubricant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Providing and fixing Orange colour safety foot rest as per specification. Mark to be visible even after fixing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Core cutting in storm water drain 100 mm to 300 mm dia complete as per satisfaction of Client</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Providing &amp; laying PVC in excavated trench for making bed for pipe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Providing piezometer with borewell with 4” dia pipe upto water table approx complete in all respect as per satisfaction of Client</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Providing measuring tape for piezometer complete in all respect as per satisfaction of Client</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Cleaning of existing RWH pit after construction including clearing of all unwanted material as per instructions of Client</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Connection of recharge structure to existing borewell/ hand pump for recharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Any additional items deemed necessary by Contractor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **Ashram**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Additional details</th>
<th>Estimate by Contractor (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Connection of roof top gutters to PVC pipes leading to the filtration unit and provision of individual taps for removing flush flush runoff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Excavation of at least 30cm below ground for pipes from rooftops and provision of high strength pipes for connecting roof top gutters to collection pit</td>
<td>40 rmt</td>
<td></td>
</tr>
<tr>
<td>3 Construction of collection chamber as per drawing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Provision of rain water filter before collection pit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Construction of filtration and rain water harvesting unit as per specifications in the drawing to recharge the bore well/hand pump</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Earth work in excavation below existing level in rain water harvesting pits etc. Including shoring, strutting, dressing sides (where required) and levelling, grading, ramming and bailing or pumping out water from the excavated areas collected from any source including sub soil water and keeping the excavated surface dry for subsequent works including taking out the excavated soil spreading in layers and stacking as directed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Providing and constructing Brick masonry as per drawings in cement mortar 1:5 mix (1 cement: 5 coarse sand). With bricks of class designation 75 and thickness specified at all heights and levels in foundations, etc as per drawing and details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Providing and laying in position plain cement concrete of specified grade including the cost of centring and shuttering</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
d. Providing and Applying. M25 Grade R.C.C slab to cover the well at top including necessary reinforcement

e. Providing & laying 15 mm thick cement plaster to walls in cement mortar

f. Providing and filling with Sand (1-2 mm) in recharge pit, including watering, ramming and consolidation, dressing complete.

a. Providing and filling with Gravel in 4 layers (3 to 6 mm, 12 to 25mm, 25 to 50mm, 50 to 65mm) in recharge pit, including watering, ramming and consolidation, dressing complete, as per drawing

b. Providing and fixing upvc pipes type –A conforming to IS 13592 for rain water pipes including all fittings rubber ring type (plain or with access door) e.g. bends, junctions, cowls, offsets, access pieces, joining with rubber ring joints with lubricant

c. Providing and fixing Orange colour safety foot rest as per specification. Mark to be visible even after fixing.

d. Core cutting in storm water drain 100 mm to 300 mm dia complete as per satisfaction of Client

e. Providing & laying PCC in excavated trench for making bed for pipe

f. Providing piezometer with borewell with 4 " dia pipe upto water table approx complete in all respect as per satisfaction of Client

g. Providing measuring tape for piezometer complete in all respect as per satisfaction of Client

h. Cleaning of existing RWH pit after construction including clearing of all unwanted material as per instructions of Client

i. Connection of recharge structure to existing borewell/ hand pump for recharge

4. Any additional item deemed necessary by the Contractor

## 4. EWS Housing

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Additional details</th>
<th>Estimate by Contractor (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection of roof top gutters to PVC pipes leading to the filtration unit</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Excavation of at least 30cm below ground for pipes from rooftops for connection to collection chamber and provision of high strength pipes to connect runoff from roof tops to collection pits</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Construction of collection chamber as per drawing</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Provision of rain water filters at the level of individual dwelling or individual unit and provision of tap for removing first flush runoff</td>
<td>4 nos</td>
</tr>
<tr>
<td>5</td>
<td>Construction of filtration and rain water harvesting unit as per specifications in the drawing to recharge the bore well/hand pump</td>
<td></td>
</tr>
</tbody>
</table>

a. Earth work in excavation below existing level in rain water harvesting pits etc. Including shoring, strutting, dressing sides (where required) and levelling, grading, ramming and bailing or pumping out water from the excavated areas collected from any source including sub soil water and keeping the excavated surface dry for subsequent works including taking out the excavated soil spreading in layers and stacking as directed

b. Providing and constructing brick masonry as per drawings in cement mortar 1:5 mix (1 cement: 5 coarse sand). With bricks of class designation 75 and thickness specified at all heights and levels in foundations, etc. as per drawing and details

c. Providing and laying in position plain cement concrete of specified grade including the cost of centring and shuttering

d. Providing and Applying. M25 Grade R.C.C slab to cover the well at top including necessary reinforcement

e. Providing & laying 15 mm thick cement plaster to walls in cement mortar

f. Providing and filling with Sand (1-2 mm) in recharge pit, including watering, ramming and consolidation, dressing complete.

g. Providing and filling with Gravel in 4 layers (3 to 6 mm, 12 to 25mm, 25 to 50mm, 50 to 65mm) in recharge pit, including watering, ramming and consolidation, dressing complete, as per drawing

h. Providing and fixing upvc pipes type –A conforming to IS 13592 for rain water pipes including all fittings rubber ring type (plain or with access door) e.g. bends, junctions, cowls, offsets, access pieces, joining with rubber ring joints with lubricant

i. Providing and fixing Orange colour safety foot rest as per specification. Mark to be visible even after fixing.

j. Core cutting in storm water drain 100 mm to 300 mm dia complete as per satisfaction of Client

k. Providing & laying PCC in excavated trench for making bed for pipe

l. Providing piezometer with borewell with 4 " dia pipe upto water table approx complete in all respect as per satisfaction of Client

m. Providing measuring tape for piezometer complete in all respect as per satisfaction of Client

n. Cleaning of existing RWH pit after construction including clearing of all unwanted material as per instructions of Client

o. Connection of recharge structure to existing borewell/hand pump for recharge

6. Any additional item deemed necessary by the Contractor

5. Plantation of 100 trees in Neelam Nagar Area (can be undertaken as part of CSR/Co funding/NGO contribution)
### Annexure 4: Water quality parameter testing

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Test Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH</td>
</tr>
<tr>
<td>2</td>
<td>Colour</td>
</tr>
<tr>
<td>3</td>
<td>Turbidity</td>
</tr>
<tr>
<td>4</td>
<td>Total Dissolved Solids</td>
</tr>
<tr>
<td>5</td>
<td>Total Hardness</td>
</tr>
<tr>
<td>6</td>
<td>Calcium Hardness</td>
</tr>
<tr>
<td>7</td>
<td>Alkalinity in Methyl Orange</td>
</tr>
<tr>
<td>8</td>
<td>Alkalinity in Phenolphthalein</td>
</tr>
<tr>
<td>9</td>
<td>Calcium</td>
</tr>
<tr>
<td>10</td>
<td>Magnesium</td>
</tr>
<tr>
<td>11</td>
<td>Sodium</td>
</tr>
<tr>
<td>12</td>
<td>Potassium</td>
</tr>
<tr>
<td>13</td>
<td>Silica</td>
</tr>
<tr>
<td>14</td>
<td>Iron</td>
</tr>
<tr>
<td>15</td>
<td>Chloride</td>
</tr>
<tr>
<td>16</td>
<td>Sulfate</td>
</tr>
<tr>
<td>17</td>
<td>Nitrites</td>
</tr>
<tr>
<td>18</td>
<td>Fluoride</td>
</tr>
<tr>
<td>19</td>
<td>Nitrites</td>
</tr>
<tr>
<td>20</td>
<td>Residual Free chlorine</td>
</tr>
<tr>
<td>21</td>
<td>Copper as Cu</td>
</tr>
<tr>
<td>22</td>
<td>Zinc as Zn</td>
</tr>
<tr>
<td>23</td>
<td>Boron as B</td>
</tr>
<tr>
<td>24</td>
<td>Sulphate as S</td>
</tr>
<tr>
<td>25</td>
<td>B.O.D. D.O.</td>
</tr>
<tr>
<td>26</td>
<td>C.O.D.</td>
</tr>
<tr>
<td>27</td>
<td>P.HCO₃</td>
</tr>
<tr>
<td>28</td>
<td>Total Phosphorus as P</td>
</tr>
<tr>
<td>29</td>
<td>Dissolved Oxygen as O₂</td>
</tr>
<tr>
<td>30</td>
<td>Arsenic</td>
</tr>
<tr>
<td>31</td>
<td>E.Coli</td>
</tr>
<tr>
<td>32</td>
<td>Fecal Coliforms</td>
</tr>
<tr>
<td>33</td>
<td>Total Coliforms</td>
</tr>
</tbody>
</table>