



Due Diligence Report

Project Number: 42266-025
May 2018

IND: Kolkata Environmental Improvement Investment Program (KEIIP), Project 2

Subproject: Water Supply System Instrumentation and Information Technology Upgrade (KEIIP/NCB/TR-2/WS26B/2018-19)

Submitted by

Kolkata Municipal Corporation, Government of West Bengal

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Asian Development Bank

Land Acquisition and Resettlement Due Diligence Report

Document stage: Draft for consultation
Project number: xxx
May 2018

**IND: WATER SUPPLY SYSTEM INSTRUMENTATION AND INFORMATION
TECHNOLOGY UPGRADE
KEIIP/NCB/TR-2/WS26B/ 2018-19**

Prepared by Kolkata Municipal Corporation (KMC) for the Asian Development Bank.

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CURRENCY EQUIVALENTS

(as of 1 May, 2018)

| | | |
|---------------|---|-------------|
| Currency unit | = | Rupee (INR) |
| INR 1.00 | = | USD 0.01504 |
| USD 1.00 | = | INR 66.4893 |

ABBREVIATIONS

| | | |
|---------|---|--|
| ADB | - | Asian Development Bank |
| BPL | - | below poverty line |
| DH | - | Diamond Harbour Road |
| ESR | - | elevated service reservoir |
| GP | - | gram panchayat |
| IR | - | involuntary resettlement |
| KEIP | - | Kolkata Environmental Improvement Project |
| KEIIP | - | Kolkata Environmental Improvement Investment Program |
| KL | - | Kiloliter |
| KMC | - | Kolkata Municipal Corporation |
| MFF | - | multi-tranche financing facility |
| NOC | - | No Objection Certificate |
| PHED | - | Public Health Engineering Department |
| PS | - | pumping station |
| ROW | - | right of way |
| SandD | - | sewerage and drainage |
| STP | - | sewage treatment plant |
| LPS | - | liters per second |
| UGR | - | underground reservoir |
| WBSECTL | - | West Bengal State Electricity Transmission Corporation Limited |

CONTENTS

| | |
|---|-----------|
| I. INTRODUCTION | 4 |
| A. BACKGROUND..... | 4 |
| B. SCOPE OF WORK..... | 5 |
| II. SUBPROJECT DESCRIPTION..... | 5 |
| III. FIELD WORK AND PUBLIC CONSULTATION..... | 7 |
| A. OUTLINE OF FIELD WORK..... | 7 |
| B. PUBLIC CONSULTATION..... | 7 |
| IV. LAND AVAILABILITY AND RESETTLEMENT IMPACT..... | 8 |
| V. CONCLUSIONS..... | 11 |
| A. SUMMARY and CONCLUSIONS..... | 11 |
| B. NEXT STEP..... | 11 |

I. INTRODUCTION

A. Background

1. On 26 September 2013, the Asian Development Bank (ADB) approved the provision of loans under a multitranche financing facility (MFF) for the Kolkata Environmental Improvement Investment Program (KEIIP or the Investment Program) for an aggregate amount not to exceed \$400 million. The impact of the Investment Program will be improved access to water supply and sanitation in Kolkata Municipal Corporation (KMC). The outcome will be improved water supply, sewerage and drainage service quality and operational sustainability in selected areas of KMC. KEIIP has three outputs: (i) inefficient water supply assets rehabilitated; (ii) sewerage extension to peripheral areas continued¹ and (iii) financial and project management capacity further developed. KMC is KEIIP's executing agency. A project management unit (PMU) created under KMC is implementing KEIIP.

2. The proposed Project 2, supported by the tranche 2 of KEIIP, will include physical and non-physical investments in water supply and sanitation improvement in KMC. Project 2 is aligned with improved access to water supply and sanitation in KMC as defined by the Investment Program. A total of eight contract packages for sewerage and drainage work are proposed under Project 2. For water supply, a total of six contract packages are proposed. Kolkata Municipal Corporation (KMC) is in the process of preparing project proposals for all proposed subprojects under Project 2 to ensure high project readiness.

3. Water supply packages identified for implementation under tranche 2 include: (i) Construction of 2 underground reservoirs (UGR) and pumping stations (PS) at Prantik Ph III and Company Pukur; 6 elevated service reservoirs (ESRs) at Prantik Phase III, North-East of South Suburban East (SSE) sewage treatment plant (STP), North-West of SSE STP, Company Pukur, WBSETC, 22 Bigha, under package TR-2 WS15; (ii) laying of transmission main from existing Daspara PS to UGRs at Prantik Ph III and Company Pukur; and transmission main from UGRs to 8 elevated service reservoirs (ESRs - 6 proposed and 2 existing), under package TR-2 WS 16; (iii) Laying of distribution system and house connection within the command area of 8 ESRs (6 proposed and 2 existing), under package TR-2 WS 17; (iv) construction of ESR at Ramkantapur, Malpara, Charaktala; laying of transmission main from UGR at Company Pukur to 3 ESRs; and laying of distribution system and house connection within the command area of 3 ESRs, under package TR-2 WS 18; (v) dedicated water supply transmission main from the junction of James Long Sarani to Daspara near existing pumping station along James Long Sarani under package TR-2 WS 24; (vi) water loss management under Jay Hind WTP Area (Eastern Kolkata), under package TR-2 WS 25; and (vii) Water Supply System Instrumentation and Information Technology Upgrade TR-2WS 26B.

¹ The 1899 Calcutta Municipal Act defined the administrative domain of the municipal authority as covering 25 wards and having an areal extent of 48.5 square kilometers. Many boundary changes followed, the latest one in January 1984 when Boroughs XI, XII, XIII, XIV and XV were annexed to KMC. These boroughs in the peripheral areas, are popularly known as "added areas".

B. Scope of this Report

4. This land acquisition and resettlement due diligence report is prepared for the proposed water supply contract package TR-2 WS26B for the installing additional instrumentation for water supply system. The additional instruments will be installed at pump station, storage, large transmission mains off-takes, reservoirs, and distribution network. A due diligence process was conducted to examine land acquisition and resettlement issues in detail, in line with ADB SPS 2009. This report describes the findings and provides copies of relevant documents, resolutions, minutes of meetings and photographs. This land acquisition and resettlement due diligence report needs to be read along with the Resettlement Framework prepared for KEIIP.

5. Upon project implementation, the Social Safeguard Officer at PMU will be required to undertake a review of this due diligence, prepare a confirmation letter or report documenting any modifications for the subproject and submit to ADB; and receive a 'no objection' confirmation from ADB prior to start of construction related to the subproject.

II. SUBPROJECT DESCRIPTION

6. The areas added to the city of Kolkata after 1984 ('added areas') have major gaps in supply of potable water. The current water supply service level falls short of desired level for the following reasons:

- Inadequate transmission system
- Intermittent supply
- Un-assessed water loss in the system
- Inequitable pressure at consumer points

7. An analysis has been made by the authority to identify appropriate interventions to overcome current deficiencies and to achieve target service levels for water supply in the immediate, intermediate and ultimate phase. KMC with support from ADB wants to continue the process of improving the water supply system through a comprehensive process involving water accountability and a water loss reduction program aimed at increased efficiency in water usage. The water loss management work in the Cossipore service zone, taken up as a pilot project in Kolkata under Tranche 1 and another project in the Anandapur and Patuli service area under Jai Hind WTP in Tranche 2, is a step towards the improvement of quality service and the sustainability in water supply and specifically in water distribution management. In this subproject, transmission network is considered for these areas which are not covered in tranche 1 and tranche 2 packages.(i.e excluding Cossipore area, Joka and adjoining area and under Jai Hind WTP area).

8. The objective of WS26B is to immediately improve the level of customer service provided to these properties, provide a vehicle to engage with the local communities and in parallel position the KMC to improve water supply in these areas.

9. Subproject WS26B is aligned with the Kolkata Environment Improvement Investment Program Framework Financing Agreement (Water Supply Component) and the Water Loss

Policy Roadmap for Kolkata Municipal Corporation of January 2016 as approved by the Mayor-in-Council. The Map in **Figure 1** shows the ward areas where improved instrumentation will be implemented.

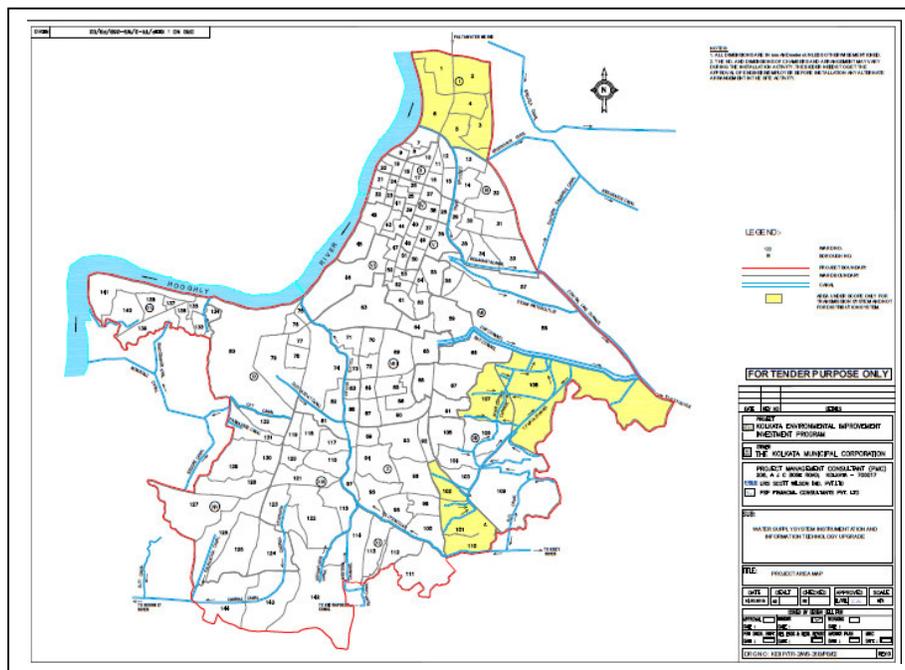
10. The objectives of installing additional instrumentation are to (1) understand the distribution of flows throughout the water supply network; (2) to provide real time information on the status of the water supply network; (3) provide the data required by the hydraulic model; (4) provide the data required to optimise the network; and (5) to operationalize the hydraulic model.

11. The objective of the system upgradation includes (1) review of the existing monitoring system and ensure it has the capacity and functionality required for Supply and Installation of Water Supply Equipment and Services, and (2) connecting the monitoring system to the GIS system.

12. The subproject will involve installation of the following instruments given below. Typical photos of pumping station and instruments proposed to be installed are given in Appendix 3.

- DI sluice valve (300 – 450 mm dia)
It is to be noted that the sluice valves will be provided for isolation for maintenance purpose and normally will be in open condition and will not occur any flooding situations.
- Full bore electromagnetic full bore flow meter (300 – 450 mm dia.)
- Electro-magnetic insertion probe type flow-meter (for 500 – 1800 mm dia) Pipe
- Ultrasonic type level transmitter
- Pressure sensor and transmitter
- Monitoring system for the above instruments
- Woltmann type water bulk meter (50-100 mm dia)
- Operation and maintenance services

Figure 1: Ward Map Showing Subproject Implementation Areas



13. The installation of these instruments proposed under this subproject primarily targets monitoring of the water flow under the water supply system. The purpose of installing the instruments is briefly described in Table 1 below.

Table 1: Purpose of Using the Instruments

| Sl.No. | Description of Items | Purpose |
|---------------|---|--|
| 1 | DI sluice valve (300 – 450 mm dia) | Before the flow meters for controlling the flow (on/off). The valves are provided for isolation for maintenance purpose and normally will be in open condition ...so flooding will not happen. |
| 2 | Full bore electromagnetic full bore flow meter (300 – 450 mm dia.) | Measurement of flow along transmission line of dia 300-450 mm |
| 3 | Electro-magnetic insertion probe type Flow-Meter (for 600 – 1800 mm dia) Pipe | Measurement of flow along transmission line of dia 500-1800 mm |
| 4 | Ultrasonic type level transmitter | For checking and monitoring water level in CWR, the data collected is sent to local RTU and from RTU to Central Control Station located at Tallah. |
| 5 | Pressure sensor and transmitter | Measure Pressure of water, the data collected is sent to local RTU and from RTU to Central Control Station located at Tallah. |
| 6 | Monitoring system for above Instruments | Automatic monitoring of the measured flows in pump stations, transmission and distribution lines |
| 7 | Woltmann type water meter (50-100 mm dia) | On distribution network as bulk flow meters for measurement of flow |
| 8 | Operation and maintenance services | For the entire proposed work |

III. FIELD WORK AND PUBLIC CONSULTATION

A. Outline of Field Work

14. In March and April 2018, field visits were carried out at the proposed subproject sites and alignment locations in the following municipal wards: 107, 108, 102, 101 and some areas under Borough I. These areas are considered for improved instrumentation under the subproject for transmission mains only.

B. Public Consultation

15. The additional instrumentation under the subproject will be implemented for better understanding of the flow throughout the water supply network and to provide real time information on the status of water supply network. The instrumentation activity will be undertaken in the existing transmission mains, pumping stations, distribution network, etc.

Hence, no public consultations were conducted for these subproject implementation, as this will be implemented at locations that are covered under other subprojects for water works.

IV. LAND AVAILABILITY AND RESETTLEMENT IMPACTS

16. As mentioned in earlier sections, this subproject (package TR2/WS26B) is conceptualised for improved instrumentation for monitoring the water flow throughout the water supply network so as to provide real time information. The following table 2 describes the different valves, flow meters, transmitters and other instruments that will be installed at different locations of the water supply system. The estimated time taken for installation of full bore meters is about 3 weeks and for insertion type flow, 2 weeks.

Table 2: Description of the Instruments and It's Location of Installation

| Sl. No | Description of Items | Approx. Quantity in Nos. | Location of Installation | IR Impact |
|--------|--|--------------------------|---|--|
| 1 | DI Sluice Valve (300 – 450 mm dia) | 12 | Before the flow meters for controlling the flow (on/off) | No IR impact anticipated. Most of the flow meters will be installed within the booster pumping stations of KMC premises. Only in a few cases, flow meters shall be installed on the transmission mains outside the pumping station premises. |
| 2 | Full Bore Electromagnetic full Bore flow meter (300 – 450 mm dia.) | 53 | Pump stations, storage areas, large transmission main off-takes | No IR impact anticipated. The pumping stations and the storage land areas are owned by KMC and are free of encumbrances or non-titled users. The transmission mains are along the government road and will not have any IR impact. |
| 3 | Electro-Magnetic Insertion Probe Type Flow-Meter (for 500 – | 97 | Pump stations, storage, large transmission main | No IR impact anticipated. The pumping stations and the storage land areas |

| | | | | |
|---|--|-----|---|--|
| | 1800 mm dia) Pipe | | off-takes | are owned by KMC and are free of encumbrances or non-titled users. The transmission mains are along the government road and will not have any IR impact. |
| 4 | Ultrasonic Type Level Transmitter | 50 | Reservoirs (e.g, CWR) | No IR impact anticipated. The land areas for reservoirs' (e.g. CWR) are owned by KMC. |
| 5 | Pressure Sensor and Transmitter | 150 | At the flowmeter locations to measure the pressure. | No IR impact anticipated. No additional land required for installation of these instruments. |
| 6 | Monitoring system for above Instruments | 1 | The monitoring system for above instruments will be installed at pumping stations, transmission mains etc. and Remote Terminal Units (RTU) s will be provided near flow meters. | No IR impact anticipated. No additional land required for installation of the monitoring system. |
| 7 | Woltmann Type Water Bulk Meter (50-100 mm dia) | 180 | On distribution network, as bulk flow meters | No IR impact anticipated as the bulk flow meters will be installed on the distribution network. |
| 8 | Operation and maintenance services | 3 | For the entire proposed work | Not applicable. |

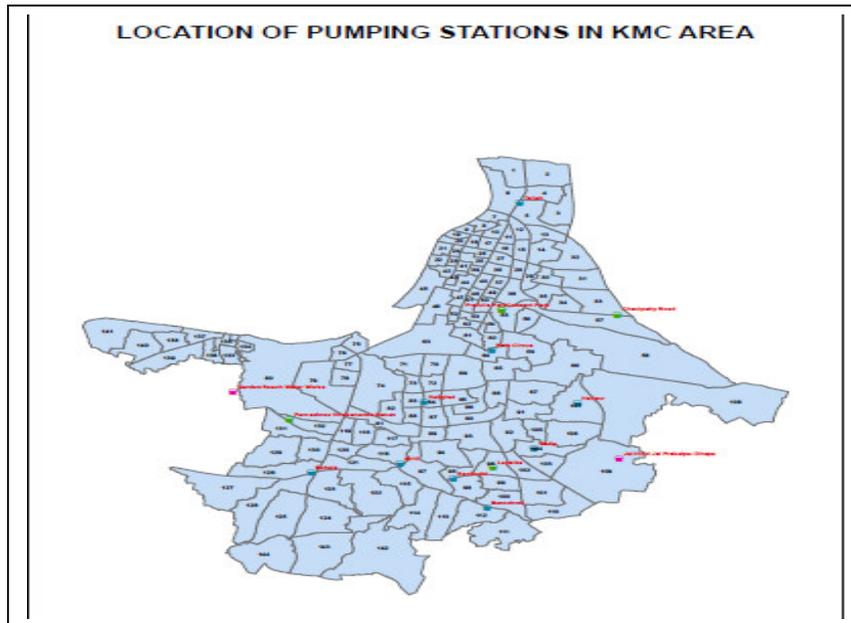
17. As the above table indicates these instruments will be installed at various locations of the water supply system that are covered under other subprojects, considering two situations (i) where water works subprojects have already been undertaken, and (ii) where water works will be undertaken (that are constructed or proposed along government roads or KMC road RoWs). Hence, implementation of this subproject will not require acquisition of any private land or any resettlement impact. Installation of the instruments may be done simultaneously

where WS subprojects will be implemented in future. However, where water works under the previous subprojects have already been implemented, at such locations trenches of approximately 1.5 m x 1.5 m will be dug for installation of the instruments, along the transmission mains and distribution network. The installation points of these instruments will be identified during the detailed measurement survey prior to start of construction. The IR impacts will be reassessed for the identified locations and the social safeguards document updated/prepared accordingly. At the pumping station locations, the trenches will be of 3 m x 3 m dimension. No additional land will be required for installation of the instruments under the subproject.

18. Installation of the instruments will be carefully planned to minimise any disturbance to the local residents, businesses, shops, etc. During the installation there may be potential temporary congestion on roads at the locations where trenches will be dug; any potential access restriction and traffic disruption will be avoided by ensuring traffic diversions, proper traffic planning and ensuring access. Traffic management, advance notice to residences and businesses prior to start of work, access to shops and businesses by providing pedestrian access through planks will be ensured by the Contractors to reduce any further impact. No economic impact or income loss is anticipated.

19. The following Figure 2 shows the locations of pumping stations in KMC Area where the instruments full bore electromagnetic flow meter and electro-magnetic insertion probe type flow-meter are proposed to be installed. The list of pumping stations and list of reservoirs is provided in Appendix 1 and 2 respectively.

Figure 2: Locations of Pumping Stations in KMC Area



V. CONCLUSIONS

A. Summary and Conclusions

20. No land acquisition and involuntary resettlement related impacts are assessed at the potential sites where the instruments will be installed, as these will be done (a) on government/KMC sites that are free of non-titleholders, and (b) within the RoW of government roads or KMC roads which are the alignments for transmission mains and distribution network. For installation of instruments along new pipe alignments proposed under various packages, no additional land requirement is envisaged; installation of such instruments will be undertaken simultaneously with pipe laying work, and separate social safeguards documents (RP/DDR as applicable) have been prepared for such packages. Installation of instruments on existing transmission/distribution pipes will be undertaken at valve locations or locations that are already under use for regular operation and maintenance work and are free of non-titleholders and users other than KMC operation and maintenance staff. No structure loss or any other permanent impact is anticipated due to installation of instruments along existing or proposed pipe alignments and none will be allowed. The contractor in consultation with PMU and engineer will ensure that access is provided to all residential and commercial properties during implementation and temporary impacts avoided.

B. Next Steps

21. The Draft DDR needs to be updated with the following information:

- i. On finalization of detailed design, the draft DDR needs to be re-assessed for any IR impacts and results of same including photographs of sites / alignments / locations where instruments are proposed to be installed, should be appended to the report.
- ii. In case of any unforeseen IR impacts are identified upon the completion of final detail design or design / alignment changes, the DDR needs to be re-assessed and the required RP will be prepared and submitted to ADB for review and endorsement.
- iii. ADB approval on the updated DDR based on the final assessment at detailed measurement survey stage needs to be obtained by the PMU prior to start of construction.

Appendix 1: List of Pumping Stations where instrumentation proposed under the Subproject TR-2 WS 26B

| SL. NO | CLASS | NAME | LATITUDE | LONGITUDE |
|--------|---------------------------------|--|-----------|-----------|
| 1 | WATER TREATMENT PLANT | Indira Gandhi Water Treatment Plant- Palta | 22.787936 | 88.353098 |
| 2 | WATER TREATMENT PLANT | Watgunge Water Treatment Plant | | |
| 3 | WATER TREATMENT PLANT | Jorabagan Water Treatment Plant | | |
| 4 | WATER TREATMENT PLANT | Jai Hind Jal Prkalpa-Dhapa | 22.492558 | 88.406600 |
| 5 | WATER TREATMENT PLANT | Garden Reach Water Works | 22.524470 | 88.288044 |
| 1 | PUMPING STATION WITH RESERVOIRS | Tallah | 22.611020 | 88.377150 |
| 2 | PUMPING STATION WITH RESERVOIRS | Subodh Mullick Square | | |
| 3 | PUMPING STATION WITH RESERVOIRS | Auckland Square | | |
| 4 | PUMPING STATION WITH RESERVOIRS | Behala | 22.487050 | 88.311724 |
| 5 | PUMPING STATION WITH RESERVOIRS | Md. Ali Park | | |
| 6 | PUMPING STATION WITH RESERVOIRS | Garfa | 22.497678 | 88.380458 |
| 7 | PUMPING STATION WITH | Park Circus | 22.543034 | 88.367829 |

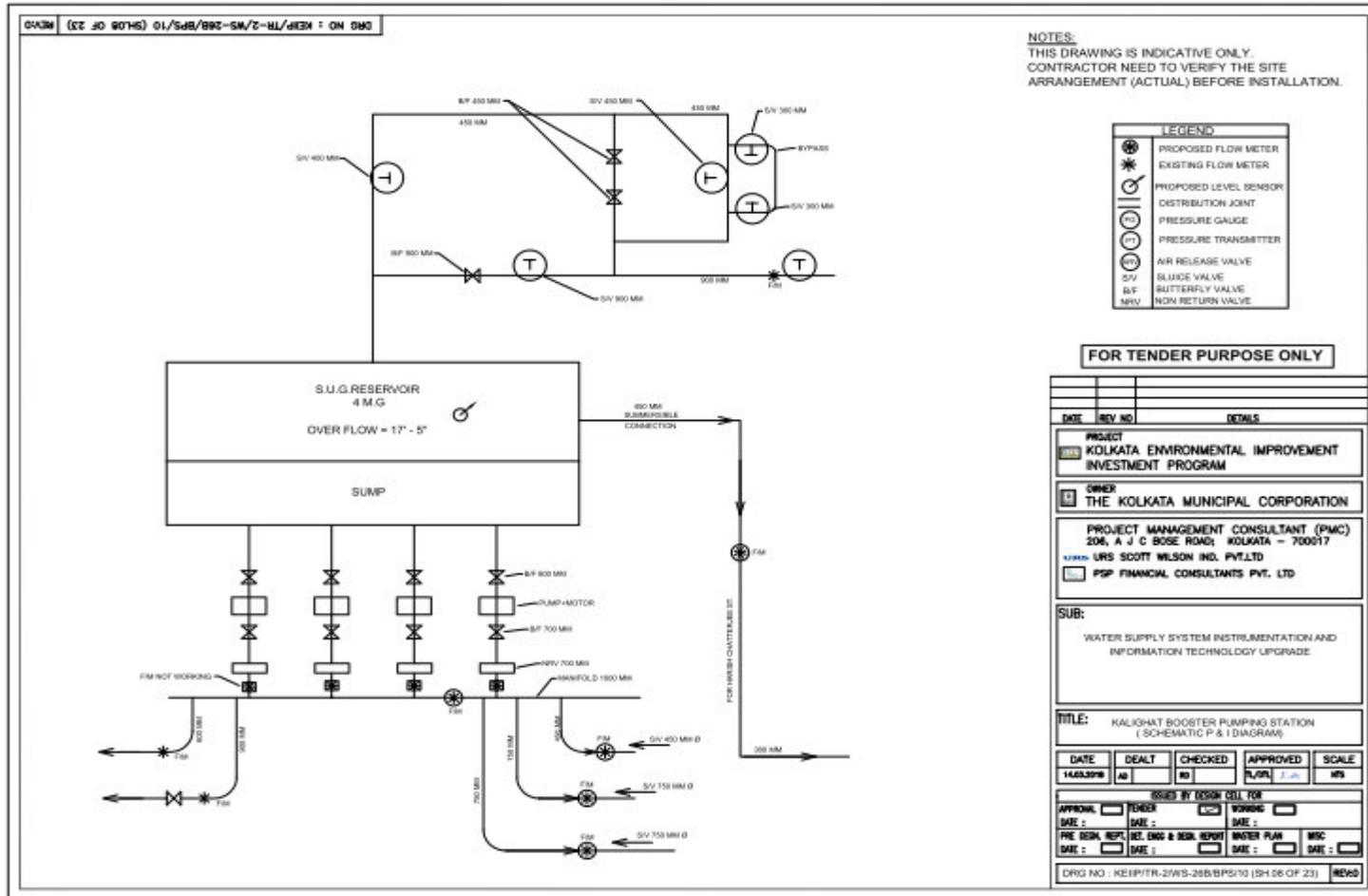
| | | | | |
|----|---------------------------------|---------------|-----------|-----------|
| | RESERVOIRS | | | |
| 8 | PUMPING STATION WITH RESERVOIRS | Ranikuthi | 22.483834 | 88.355339 |
| 9 | PUMPING STATION WITH RESERVOIRS | Kalighat | 22.519093 | 88.346758 |
| 10 | PUMPING STATION WITH RESERVOIRS | Bansdroni | 22.470260 | 88.365641 |
| 11 | PUMPING STATION WITH RESERVOIRS | Siriti | 22.490755 | 88.339090 |
| 12 | PUMPING STATION WITH RESERVOIRS | Anandapur | | |
| 13 | PUMPING STATION WITH RESERVOIRS | Gandhi Maidan | | |
| 14 | PUMPING STATION WITH RESERVOIRS | Telipara | | |
| 15 | PUMPING STATION WITH RESERVOIRS | Baishnabghata | | |
| 16 | PUMPING STATION WITH RESERVOIRS | Patuli | | |
| 17 | PUMPING STATION WITH RESERVOIRS | Chetla | | |
| 18 | PUMPING STATION WITH RESERVOIRS | G J Khan Road | | |
| 19 | PUMPING STATION WITH RESERVOIRS | Kherjurtala | | |
| 20 | PUMPING STATION WITH RESERVOIRS | Shanti Pally | | |
| 21 | PUMPING STATION WITH RESERVOIRS | Hatisur | 22.518549 | 88.394057 |
| 22 | PUMPING STATION WITH RESERVOIRS | Phool Bagan | | |
| 23 | PUMPING STATION WITH RESERVOIRS | Narkel Bagan | | |
| 24 | PUMPING STATION WITH RESERVOIRS | Lalgate | | |

| | | | | |
|----|--|------------------------------|-----------|-----------|
| 25 | PUMPING STATION WITH RESERVOIRS | Mukundapur | | |
| 1 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Convent Park | 22.561575 | 88.371156 |
| 2 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Prafulla Park | 22.561575 | 88.371156 |
| 3 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Chaulpatty Road | 22.559335 | 88.406820 |
| 4 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Sen Pally | | |
| 5 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Parnashree Vivekananda Kanan | 22.511603 | 88.305358 |
| 6 | UNDER CONSTRUCTION (BOOSTER PUMPING STATION) | Layalka | 22.488683 | 88.367772 |

Appendix 2: List of Reservoirs where instrumentation proposed under the Subproject TR-2 WS 26B

| Sl. No. | Name of the BPS | Capacity(MG) |
|----------------|-----------------------------------|---------------------|
| 1 | Sen Pally | 3 |
| 2 | Behala Chowrasta | 4.5 |
| 3 | Daspara | 3.5 |
| 4 | Sirity | 2.44 |
| 5 | Prafulla Park | 3 |
| 6 | Banshdroni | 2 |
| 7 | Garfa | 3.5 |
| 8 | Kalighat | 4 |
| 9 | Chetla | 2 |
| 10 | G.J Khan | 2 |
| 11 | Auckland | 6 |
| 12 | Raja Subodh Mullick | 6 |
| 13 | Park Circus | 4.5 |
| 14 | Kasba | 3.5 |
| 15 | Anandapur (Jai Hind Jal Prakalpa) | 0.5 |
| 16 | Mukundapur | 0.5 |
| 17 | Patuli | 5 |
| 18 | New park | 3 |
| 19 | Chaul Patty | 5.5 |
| 20 | MD ali Park | 3.5 |
| 21 | Bagmari | 6 |
| 22 | Convent park | 3 |
| 23 | Layalka | 1.8 |

Appendix 3: Typical Locations and Photos of typical Instrument Installations



Photographs of Typical Location - Kalighat Pumping Station

