

## 添付資料



REVISION OF PDM

Item	Version 1 30 August 2013 (1 <sup>st</sup> JCC)	Version 2 27 August 2014 (2 <sup>nd</sup> JCC)	Version 3 24 December 2015 (4 <sup>th</sup> JCC)	Version 4 10 March 2016 (5 <sup>th</sup> JCC)	Version 5 4 August 2016 (6 <sup>th</sup> JCC)
Version number	-	-	-	-	PDM Version 5 as of 4 August 2016
Duration of Period:	-	-	-	Four years and ten months from June 2013 (June 2013 - March 2018)	-
Note:	Unfixed figures (X and Y) in PDM shall be decided after activity 2-3-5, probably 18 months after the start of the Assistance. The PDM was approved at the 1st JCC	Unfixed figures (X and Y) in PDM shall be decided after activity 2-3-5, probably 25 months after the start of the Assistance. The PDM was approved at the 2nd JCC	Unfixed figures (X and Y) in PDM shall be decided within 2 months after the SCADA operation starts.	Unfixed figures(X and Y) in PDM shall be decided during activity 2-3-5.	-
Activity	-	-	-	This PDM is approved at the 5th JCC. The "Duration of Period", however, becomes effective after approval of "Minutes of meetings for amendment of the Record of Discussions".	<Delete>
Inputs [Japanese side]	1. Japanese Experts (1) Chief Advisor (2) GIS Application (3) Pipe-Network(1) (4) Pipe-Network(2) (5) GIS Mapping (5) SCADA (6) NRW Analyst (6) DMA (8) Leak Detection (9) Water Supply Management (10) Project Coordinator (11) Others (by Mutual consent)  2. Local Consultants	-	-	-	2-3-4. (a) Construct a demonstration chamber to check its performance (b) Implement improvement works for water ingress of the constructed chambers (c) Install the equipment and conduct trial runs of SCADA system
Inputs [DJB Side]	1. Japanese Experts (1) Chief Advisor (2) GIS Application (3) Pipe-Network(1) (4) Pipe-Network(2) (5) GIS Mapping (5) SCADA (6) NRW Analyst (7) DMA (8) Leak Detection (9) Water Supply Management (10) Project Coordinator (11) Others (by Mutual consent)  2. Local Consultants	-	-	1. Japanese Experts (1) Chief Advisor (2) GIS Application (3) Pipe-Network(1) (4) Pipe-Network(2) (5) GIS Mapping/ Project Coordinator (6) SCADA (7) NRW Analyst (8) DMA (9) Leak Detection (10) Water Supply Management (11) Project Coordinator (12) Others (by Mutual consent) (13) Civil engineer  2. Local Consultants	[Reason] Duplications were omitted <Delete and indicate it as in Activity 2-3-4 (a)> <Delete and indicate it as in Activity 2-3-4 (b)>

Project Design Matrix (PDM)		Duration of Period: three years from June 2013					
Name of project:	The Assistance related to Delhi Water Supply Improvement Project	Target group:	DJB personnel				
Project area:	Chandrawal treatment system area and Pitampura area	Narrative Summary	Objectively Verifiable Indicator				
Overall Goal:	To achieve the equitable and continuous water distribution in the National Capital Territory of Delhi, by improving the water supply network including service network to customers, thereby contributing in upgrading citizen's living standard	Service hours in Chandrawal WTP command area to customers(hours/day) is 24 hours	Same as evaluation of "Delhi Water Supply Improvement Project"				
Project Purpose:	DJB's capacity for the implementation of "Delhi water supply improvement project" is strengthened.	NRW ratio in Chandrawal WTP command area is less than 15%.	Confirmation of contents of DPRs				
1. DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened.	1-1-1. Review of the existing distribution pipes	Tariff collection ratio in Chandrawal WTP command area is more than 90%	1a. Confirmation of contents of DPRs				
2. DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded.	1-1-2. Selection for replacement	Basic information on pipe-networks is reflected in DPR for components 2-4 of "Delhi Water Supply Improvement Project" prepared by DJB.	b. Reports on water pressure and volume of DMAs				
3. Draft of scenarios for stage wise development of GIS/RMS application in DJB is prepared	1-1-3. Review on new pipes suggested in Master Plan	The gap among DMAs in water pressure and volume based on DMAs' demand is reduced. (Pressure: From X meters to Y meters, Volume: From X m <sup>3</sup> per connection to Y m <sup>3</sup> per connection.)	c. Confirmation of contents of DPRs				
0. The assistance is managed and coordinated properly	1-1-4. Distribution pipe network confirmation with support of local staff and GIS data	Guideline for introduction of asset management based on scenarios for stage wise development of GIS/RMS application is reflected in DPR for component 5 of "Delhi Water Supply Improvement Project" prepared by DJB	1a. DJB's Authorization on construction method				
1. Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area	1-1-5. Design proposal of pipes laying location	Construction methods of pipe crossing (railways, rivers, and major roads) and laying method (Open-cut and trenchless) for "Delhi Water Supply Improvement Project" are determined by DJB.	1b. DJB's Authorization of Reports on pipeline route				
1-1-1. Obtain necessary information for detailed design of Delhi water supply improvement project	1-1-6. Preliminary Design of laying and crossing methods	DJB can control the water flow/pressure properly with distribution pipes for "Delhi Water Supply Improvement Project" are determined by DJB	2a. Field Assessment by concerned experts				
1-1-2. Review of the existing distribution pipes	1-1-7. Survey for new pipe lines	SCADA based on the manuals and guidelines prepared by the Assistance in the pilot project area	2b. Record on data of NRW ratio				
1-1-3. Selection for replacement	1-2. Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information	NRW ratio is clarified and continuously observed in the pilot project area	3. Minutes of Meeting on submission of draft of guideline on asset management to DJB.				
1-1-4. Distribution pipe network confirmation with support of local staff and GIS data	2. Upgrading capacity to monitor and control the water distribution	Draft of guideline for introduction of asset management is prepared					
1-1-5. Design proposal of pipes laying location	2-1. Summarizing issues by reviewing the situation of SCADA use in DJB						
1-1-6. Preliminary Design of laying and crossing methods	2-2. Introduction of Japanese experience and its system to DJB						
1-1-7. Survey for new pipe lines	2-3. Operation of pilot project (equitable distribution and NRW monitoring)						
1-2. Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information	2-3-1. Confirmation on existing distribution pipes network condition in pilot area						
2. Upgrading capacity to monitor and control the water distribution	2-3-2. Pilot project operation plan						
2-1. Summarizing issues by reviewing the situation of SCADA use in DJB	2-3-3. Quantitative estimate of demand in each DMA						
2-2. Introduction of Japanese experience and its system to DJB	2-3-4. Procurement of equipment and test operation for pilot project						
2-3. Operation of pilot project (equitable distribution and NRW monitoring)	2-3-5. Flow amount and pressure monitoring within SCADA pilot project area						
2-3-1. Confirmation on existing distribution pipes network condition in pilot area	2-3-6. Identification of issues related to equitable water supply and discussion and determination for its solution						
2-3-2. Pilot project operation plan	2-3-7. Implementation of control method and examination of its effectiveness						
2-3-3. Quantitative estimate of demand in each DMA	2-3-8. Water bill calculation within the pilot area based on revenue management system data						
2-3-4. Procurement of equipment and test operation for pilot project	2-3-9. Calculation of NRW ratio						
2-3-5. Flow amount and pressure monitoring within SCADA pilot project area	2-3-10. Leakage detection demonstration in the pilot area						
2-3-6. Identification of issues related to equitable water supply and discussion and determination for its solution	2-3-11. Formulation of manual and guideline for flow amount and pressure controls and NRW monitoring						
2-3-7. Implementation of control method and examination of its effectiveness	2-3-12. Seminar presenting the results of pilot project						
2-3-8. Water bill calculation within the pilot area based on revenue management system data	2-4. Identification of issues around equitable distribution and NRW monitoring						
2-3-9. Calculation of NRW ratio	3. Draft of scenarios for stage wise development of GIS/RMS application in DJB						
2-3-10. Leakage detection demonstration in the pilot area	3-1. Review on DJB's administration strategy, vision and operation plan						
2-3-11. Formulation of manual and guideline for flow amount and pressure controls and NRW monitoring	3-2. Identification of obstacles to achieve above strategy, vision and plan						
2-3-12. Seminar presenting the results of pilot project	3-3. Review on development situation on RMS and GIS						
2-4. Identification of issues around equitable distribution and NRW monitoring	3-4. Understand the content of system and the example of GIS and RMS usage in Japan						
3. Draft of scenarios for stage wise development of GIS/RMS application in DJB	3-5. Formulation of GIS and RMS utilization application scenario by 2021						
3-1. Review on DJB's administration strategy, vision and operation plan	3-6. Formulation of GIS/RMS development scenario by 2021						
3-2. Identification of obstacles to achieve above strategy, vision and plan	3-7. Formulation of asset management introduction guideline						
3-3. Review on development situation on RMS and GIS	0-1. Organize Joint Coordinating Committee (JCC) meeting at least once a year						
3-4. Understand the content of system and the example of GIS and RMS usage in Japan	0-2. Finalize the indicators of the PDM and the Plan of Operations (PO) for approval of the first JCC meeting						
3-5. Formulation of GIS and RMS utilization application scenario by 2021	0-3. Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC						
3-6. Formulation of GIS/RMS development scenario by 2021	0-4. Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC						
3-7. Formulation of asset management introduction guideline							
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<p><b>Activities</b></p> <p>1. Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area</p> <p>1-1. Obtain necessary information for detailed design of Delhi water supply improvement project</p> <p>1-1-1. Review of the existing distribution pipes</p> <p>1-1-2. Selection for replacement</p> <p>1-1-3. Review on new pipes suggested in Master Plan</p> <p>1-1-4. Distribution pipe network confirmation with support of local staff and GIS data</p> <p>1-1-5. Design proposal of pipes laying location</p> <p>1-1-6. Preliminary Design of laying and crossing methods</p> <p>1-1-7. Survey for new pipe lines</p> <p>1-2. Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information</p> <p>2. Upgrading capacity to monitor and control the water distribution</p> <p>2-1. Summarizing issues by reviewing the situation of SCADA use in DJB</p> <p>2-2. 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Counterpart personnel</p> <p>2) Project Director</p> <p>3) Deputy Project Manager</p> <p>4) Officer in charge of Pilot Project</p> <p>(b) Technical personnel</p> <p>1) WTP &amp; Rising Main in Chandrawal Command Area</p> <p>2) Distribution network in Chandrawal Command Area</p> <p>3) Pipe network in Pilot Project area</p> <p>4) Pumping Station in Pilot project area</p> <p>5) SCADA</p> <p>6) GIS Mapping</p> <p>7) GIS Application</p> <p>8) RMS</p> <p>2. Office Spaces and Facilities</p> <p>3. Permissions to access DSSDI and existing DJB's GIS data and necessary information</p> <p>4. Daily payment to CP, cost of operation</p> <p>5. Civil work for chamber construction</p> <p>6. Permission for construction from related authorities</p>		<p><b>Means of Verification</b></p> <p>Same as evaluation of "Delhi Water Supply Improvement Project"</p> <p>a. Confirmation of contents of DPRs</p> <p>b. Reports on water pressure and volume of DMAs</p> <p>c. Confirmation of contents of DPRs</p> <p>1a. DJB's Authorization on construction method</p> <p>1b. DJB's Authorization of Reports on pipeline route</p> <p>2a. Field Assessment by concerned experts</p> <p>2b. Record on data of NRW ratio</p> <p>3. Minutes of Meeting on submission of draft of guideline on asset management to DJB.</p>		<p><b>Important Assumption</b></p> <p>"Delhi Water Supply Improvement Project" is completed as planned</p> <p>Consultants of "Delhi Water Supply Improvement Project" implement the detailed design work as scheduled.</p> <p>1. Water is delivered to UGR in the Pitampura pilot project area from the Harderpur Water Treatment Plant</p> <p>2. Pumps and other equipment run without major disruptions</p> <p><b>Precondition:</b></p> <p>1. DSSDI GIS data on utilities other than water pipelines can be used.</p> <p>2. The scope of "Delhi Water Supply Improvement Project" is not changed dramatically.</p>	

Notes: Unfixed figures (X and Y) in PDM shall be decided after activity 2-3-5, probably 18 months after the start of the Assistance. The PDM was approved at the 1<sup>st</sup> JCC.

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Important Assumption				
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Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC</p> <p>0-4. Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC</p>	<p>The Assistance related to Delhi Water Supply Improvement Project</p> <p>Target group: DIB personnel</p> <p>Objectively Verifiable Indicator</p> <p>Service hours in Chandrawal WTP command area to customers(hours/day) is 24 hours NRW ratio in Chandrawal WTP command area is less than 15%. Tariff collection ratio in Chandrawal WTP command area is more than 90%</p> <p>Basic information on pipe-networks is reflected in DPR for components 2-4 of "Delhi Water Supply Improvement Project" prepared by DIB. The gap among DMAs in water pressure and volume based on DMAs' demand is reduced. (Pressure: From X meters to Y meters, Volume: From X m<sup>3</sup> per connection to Y m<sup>3</sup> per connection.) Guideline for introduction of asset management based on scenarios for stage wise development of GIS/RMS application is reflected in DPR for component 5 of "Delhi Water Supply Improvement Project" prepared by DIB</p> <p>1a. Construction methods of pipe crossing (railways, rivers, and major roads) and laying method (Open-cut and Trenchless) for "Delhi Water Supply Improvement Project" are determined by DIB.</p> <p>1b. Locations (alignment and depth) of transmission and distribution pipes for "Delhi Water Supply Improvement Project" are determined by DJB</p> <p>2a. DJB can control the water flow/pressure properly with SCADA based on the manuals and guidelines prepared by the Assistance in the pilot project area</p> <p>2b. NRW ratio is clarified and continuously observed in the pilot project area</p> <p>3. Draft of guideline for introduction of asset management is prepared</p>	<p>Japanese Side</p> <p>1. 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<p>1. Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area</p> <p>1-1. Obtain necessary information for detailed design of Delhi water supply improvement project</p> <p>1-1-1. Review of the existing distribution pipes</p> <p>1-1-2. Selection for replacement</p> <p>1-1-3. Review on new pipes suggested in Master Plan</p> <p>1-1-4. Distribution pipe network confirmation with support of local staff and GIS data</p> <p>1-1-5. Design proposal of pipes laying location</p> <p>1-1-6. Preliminary Design of laying and crossing methods</p> <p>1-1-7. Survey for new pipe lines</p> <p>1-2. Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information</p> <p>2. Upgrading capacity to monitor and control the water distribution</p> <p>2-1. Summarizing issues by reviewing the situation of SCADA use in DJB</p> <p>2-2. Introduction of Japanese experience and its system to DJB</p> <p>2-3. 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Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC</p> <p>0-4. Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC</p>	<p>The Assistance related to Delhi Water Supply Improvement Project</p> <p>Target group: DIB personnel</p> <p>Objectively Verifiable Indicator</p> <p>Service hours in Chandrawal WTP command area to customers(hours/day) is 24 hours NRW ratio in Chandrawal WTP command area is less than 15%. Tariff collection ratio in Chandrawal WTP command area is more than 90%</p> <p>Basic information on pipe-networks is reflected in DPR for components 2-4 of "Delhi Water Supply Improvement Project" prepared by DIB. The gap among DMAs in water pressure and volume based on DMAs' demand is reduced. (Pressure: From X meters to Y meters, Volume: From X m<sup>3</sup> per connection to Y m<sup>3</sup> per connection.) Guideline for introduction of asset management based on scenarios for stage wise development of GIS/RMS application is reflected in DPR for component 5 of "Delhi Water Supply Improvement Project" prepared by DIB</p> <p>1a. Construction methods of pipe crossing (railways, rivers, and major roads) and laying method (Open-cut and Trenchless) for "Delhi Water Supply Improvement Project" are determined by DIB.</p> <p>1b. Locations (alignment and depth) of transmission and distribution pipes for "Delhi Water Supply Improvement Project" are determined by DJB</p> <p>2a. DJB can control the water flow/pressure properly with SCADA based on the manuals and guidelines prepared by the Assistance in the pilot project area</p> <p>2b. NRW ratio is clarified and continuously observed in the pilot project area</p> <p>3. Draft of guideline for introduction of asset management is prepared</p>	<p>Japanese Side</p> <p>1. Japanese Experts: (1)Chief Advisor (2)GIS Application (3)Pipe-Network(1) (4)Pipe-Network(2) (5)GIS Mapping (5)SCADA (6)NRW Analyst (6)DMA (8)Leak Detection (9)Water Supply Management (10)Project Coordinator (11)Others (by Mutual consent)</p> <p>2. Local Consultants</p> <p>3. Equipment</p> <p>4. Training of DIB personnel concerned with the Assistance in Japan</p> <p>5. Seminars on Japanese water utilities in Delhi</p>	<p>[DJB Side]</p> <p>(a) Management Personnel</p> <p>1. Counterpart personnel</p> <p>1) Project Director</p> <p>2) Project Manager</p> <p>3) Deputy Project Manager</p> <p>4) Officer in charge of Pilot Project</p> <p>(b) Technical personnel</p> <p>1) WTP &amp; Rising Main in Chandrawal Command Area</p> <p>2) Distribution network in Chandrawal Command Area</p> <p>3) Pipe network in Pilot Project area</p> <p>4) Pumping Station in Pilot project area</p> <p>5) SCADA</p> <p>6) GIS Mapping</p> <p>7) GIS Application</p> <p>8) RMS</p> <p>2. Office Spaces and Facilities</p> <p>3. Permissions to access DSSDI and existing DJB's GIS data and necessary information</p> <p>4. Daily payment to CP, cost of operation</p> <p>5. Civil work for chamber construction</p> <p>6. Permission for construction from related authorities</p>	<p>1. Water is delivered to UGR in the Pitampura pilot project area from the Haiderpur Water Treatment Plant</p> <p>2. Pumps and other equipment run without major disruptions</p> <p><b>Precondition:</b></p> <p>1. DSSDI GIS data on utilities other than water pipelines can be used.</p> <p>2. The scope of "Delhi Water Supply Improvement Project" is not changed dramatically.</p>

Notes: Unfixed figures (X and Y) in PDM shall be decided after activity 2-3-5, probably 25 months after the start of the Assistance.  
The PDM was approved at the 2<sup>nd</sup> JCC.

Project Design Matrix (PDM)		Duration of Period: three years from June 2013	
Name of project:	The Assistance related to Delhi Water Supply Improvement Project	Target group:	DIB personnel
Project area:	Chandrawal treatment system area and Pitampura area	Narrative Summary	
Overall Goal:	To achieve the equitable and continuous water distribution in the National Capital Territory of Delhi, by improving the water supply network including service network to customers, thereby contributing in upgrading citizen's living standard	Objectively Verifiable Indicator	Means of Verification
Project Purpose:	DJB's capacity for the implementation of "Delhi water supply improvement project" is strengthened.	Important Assumption	Same as evaluation of "Delhi Water Supply Improvement Project"
Outputs:	<ol style="list-style-type: none"> <li>DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened.</li> <li>DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded.</li> <li>Draft of scenarios for stage wise development of GIS/RMS application in DIB is prepared</li> <li>The assistance is managed and coordinated properly</li> </ol>	<ol style="list-style-type: none"> <li>Confirmation of contents of DPRs</li> <li>Reports on water pressure and volume of DMAs</li> <li>Confirmation of contents of DPRs</li> </ol>	"Delhi Water Supply Improvement Project" is completed as planned
Activities	<ol style="list-style-type: none"> <li>Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area                             <ol style="list-style-type: none"> <li>Obtain necessary information for detailed design of Delhi water supply improvement project</li> <li>Review of the existing distribution pipes</li> <li>Selection for replacement</li> <li>Review on new pipes suggested in Master Plan</li> <li>Distribution pipe network confirmation with support of local staff and GIS data</li> <li>Design proposal of pipes laying location</li> <li>Preliminary Design of laying and crossing methods</li> <li>Survey for new pipe lines</li> <li>Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information</li> </ol> </li> <li>Upgrading capacity to monitor and control the water distribution                             <ol style="list-style-type: none"> <li>Summarizing issues by reviewing the situation of SCADA use in DIB</li> <li>Introduction of Japanese experience and its system to DJB</li> <li>Operation of pilot project (equitable distribution and NRW monitoring)</li> <li>Confirmation on existing distribution pipes network condition in pilot area</li> <li>Pilot project operation plan</li> <li>Quantitative estimate of demand in each DMA</li> <li>Procurement of equipment and test operation for pilot project</li> <li>Flow amount and pressure monitoring within SCADA pilot project area</li> <li>Identification of issues related to equitable water supply and discussion and determination for its solution</li> <li>Implementation of control method and examination of its effectiveness</li> <li>Water bill calculation within the pilot area based on revenue management system data</li> <li>Calculation of NRW ratio</li> <li>Leakage detection demonstration in the pilot area</li> <li>Formulation of manual and guideline for flow amount and pressure controls and NRW monitoring</li> <li>Seminar presenting the results of pilot project</li> <li>Identification of issues around equitable distribution and NRW monitoring</li> </ol> </li> <li>Draft of scenarios for stage wise development of GIS/RMS application in DIB                             <ol style="list-style-type: none"> <li>Review on DJB's administration strategy, vision and operation plan</li> <li>Identification of obstacles to achieve above strategy, vision and plan</li> <li>Review on development situation on RMS and GIS</li> <li>Understand the content of system and the example of GIS and RMS usage in Japan</li> <li>Formulation of GIS and RMS utilization application scenario by 2021</li> <li>Formulation of GIS/RMS development scenario by 2021</li> <li>Formulation of asset management introduction guideline</li> </ol> </li> <li>Organize Joint Coordinating Committee (JCC) meeting at least once a year                             <ol style="list-style-type: none"> <li>Finalize the indicators of the PDM and the Plan of Operations (PO) for approval of the first JCC meeting</li> <li>Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC</li> <li>Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Construction methods of pipe crossing (railways, rivers, and major roads) and laying method (Open-cut and Trenchless) for "Delhi Water Supply Improvement Project" are determined by DIB.</li> <li>Locations (alignment and depth) of transmission and distribution pipes for "Delhi Water Supply Improvement Project" are determined by DJB</li> <li>DJB can control the water flow/pressure properly with SCADA based on the manuals and guidelines prepared by the Assistance in the pilot project area</li> <li>NRW ratio is clarified and continuously observed in the pilot project area</li> <li>Draft of guideline for introduction of asset management is prepared</li> </ol>	<ol style="list-style-type: none"> <li>Water is delivered to UGR in the Pitampura pilot project area from the Haiderpur Water Treatment Plant</li> <li>Pumps and other equipment run without major disruptions</li> </ol>
Inputs	<p>[Japanese Side]</p> <ol style="list-style-type: none"> <li>Japanese Experts:                             <ol style="list-style-type: none"> <li>Chief Advisor</li> <li>GIS Application</li> <li>Pipe-Network(1)</li> <li>Pipe-Network(2)</li> <li>GIS Mapping</li> <li>SCADA</li> <li>NRW Analyst</li> <li>DMA</li> <li>Leak Detection</li> <li>Water Supply Management</li> <li>Project Coordinator</li> <li>Others (by Mutual consent)</li> </ol> </li> <li>Local Consultants</li> <li>Equipment</li> <li>Training of DIB personnel concerned with the Assistance in Japan</li> <li>Seminars on Japanese water utilities in Delhi</li> </ol>	<p>[DJB Side]</p> <ol style="list-style-type: none"> <li>Management Personnel                             <ol style="list-style-type: none"> <li>Project Director</li> <li>Project Manager</li> <li>Deputy Project Manager</li> <li>Officer in charge of Pilot Project</li> </ol> </li> <li>Technical personnel                             <ol style="list-style-type: none"> <li>WTP &amp; Rising Main in Chandrawal Command Area</li> <li>Distribution network in Chandrawal Command Area</li> <li>Pipe network in Pilot Project area</li> <li>Pumping Station in Pilot project area</li> <li>SCADA</li> <li>GIS Mapping</li> <li>GIS Application</li> <li>RMS</li> </ol> </li> <li>Office Spaces and Facilities</li> <li>Permissions to access DSSDI and existing DJB's GIS data and necessary information</li> <li>Daily payment to CP, cost of operation</li> <li>Civil work for chamber construction</li> <li>Permission for construction from related authorities</li> </ol>	<p><b>Precondition:</b></p> <ol style="list-style-type: none"> <li>DSSDI GIS data on utilities other than water pipelines can be used.</li> <li>The scope of "Delhi Water Supply Improvement Project" is not changed dramatically.</li> </ol>

Notes: Unfixed figures (X and Y) in PDM shall be decided within 2 months after the SCADA operation starts.

**Project Design Matrix (PDM)**

Name of project: The Assistance related to Delhi Water Supply Improvement Project		Duration of Period: four years and ten months from June 2013 (June 2013 – March 2018)	
Project area: Chandrawal treatment system area and Pitampura area		Target group: DJB, personally	
Narrative Summary			
Objective/ Verifiable Indicator			
Means of Verification		Important Assumption	
<p>Overall Goal: To achieve the equitable and continuous water distribution in the National Capital Territory of Delhi, by improving the water supply network, including service network to customers, thereby contributing in upgrading citizen's living standard</p> <p>Project Purpose: DJB's capacity for the implementation of "Delhi water supply improvement project" is strengthened.</p>		<p>Same as evaluation of "Delhi Water Supply Improvement Project"</p> <p>a. Confirmation of contents of DPRs b. Reports on water pressure and volume of DMAs c. Confirmation of contents of DPRs</p> <p>"Delhi Water Supply Improvement Project" is completed as planned</p>	
<p>1. DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened.</p> <p>2. DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded.</p> <p>3. Draft of scenarios for stage wise development of GIS/RMS application in DJB is prepared</p> <p>0. The assistance is managed and coordinated properly</p>		<p>1a. DJB's Authorization on construction method 1b. DJB's Authorization of Reports on pipeline route 2a. Field Assessment by concerned experts 2b. Record on data of NRW ratio 3. Minutes of Meeting on submission of draft of guideline on asset management to DJB</p> <p>1a. Water is delivered to UGR in the Pitampura pilot project area from the Haiderpur Water Treatment Plant 2. Pumps and other equipment run without major disruptions</p>	
<p>1. Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area</p> <p>1-1. Obtain necessary information for detailed design of Delhi water supply improvement project</p> <p>1-1-1. Review of the existing distribution pipes</p> <p>1-1-2. Selection for replacement</p> <p>1-1-3. Review on new pipes suggested in Master Plan</p> <p>1-1-4. Distribution pipe network confirmation with support of local staff and GIS data</p> <p>1-1-5. Design proposal of pipes: laying location</p> <p>1-1-6. Preliminary Design of laying and crossing methods</p> <p>1-1-7. Survey for new pipe lines</p> <p>1-2. Surveys and GIS data creation on Chandrawal WTP and booster pumping station and examination on pipes information</p> <p>2. Upgrading capacity to monitor and control the water distribution</p> <p>2-1. Summarizing issues by reviewing the situation of SCADA use in DJB</p> <p>2-2. Introduction of Japanese experience and its system to DJB (monitoring)</p> <p>2-3. Operation of pilot project (equitable distribution and NRW monitoring)</p> <p>2-3-1. Confirmation on existing distribution pipes network condition in pilot area</p> <p>2-3-2. Pilot project operation plan</p> <p>2-3-3. Quantitative estimate of demand in each DMA</p> <p>2-3-4. Procurement of equipment and test operation for pilot project</p> <p>2-3-5. Flow amount and pressure monitoring within SCADA pilot project area</p> <p>2-3-6. Identification of issues related to equitable water supply and discussion and determination for its solution</p> <p>2-3-7. Implementation of control method and examination of its effectiveness</p> <p>2-3-8. Water bill calculation within the pilot area based on revenue management system data</p> <p>2-3-9. Calculation of NRW ratio</p> <p>2-3-10. Leakage detection demonstration in the pilot area</p> <p>2-3-11. Formulation of manual and guideline for flow amount and pressure controls and NRW monitoring</p> <p>2-3-12. Seminar presenting the results of pilot project</p> <p>2-4. Identification of issues around equitable distribution and NRW monitoring</p> <p>3. Draft of scenarios for stage wise development of GIS/RMS application in DJB</p> <p>3-1. Review on DJB's administration strategy, vision and operation plan</p> <p>3-2. Identification of obstacles to achieve above strategy, vision and plan</p> <p>3-3. Review on development situation on RMS and GIS</p> <p>3-4. Understand the content of system and the example of GIS and RMS usage in Japan</p> <p>3-5. Formulation of GIS and RMS utilization application scenario by 2021</p> <p>3-6. Formulation of GIS/RMS development scenario by 2021</p> <p>3-7. Formulation of asset management introduction guideline</p> <p>0-1. Organize Joint Coordinating Committee (JCC) meeting at least once a year</p> <p>0-2. Finalize the indicators of the PDM and the Plan of Operations (PO) for approval of the first JCC meeting</p> <p>0-3. Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC</p> <p>0-4. Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC</p>		<p>Inputs</p> <p>[Japanese Side]</p> <ol style="list-style-type: none"> <li>Japanese Experts: (1) Chief Advisor (2) GIS Application (3) Pipe-Network(1) (4) Pipe-Network(2) (5) GIS Mapping/ Project Coordinator (6) SCADA (7) NRW Analyst (8) DMA (9) Leak Detection (10) Water Supply Management (11) Project Coordinator (12) Others (by Mutual consent) (13) Civil engineer</li> <li>Local Consultants</li> <li>Equipment</li> <li>Training of DJB personnel concerned with the Assistance in Japan</li> <li>Seminars on Japanese water utilities in Delhi</li> <li>Civil work for construction of a demonstration chamber</li> <li>Civil work for improvement of chambers</li> </ol> <p>[DJB Side]</p> <p>(a) Management Personnel</p> <ol style="list-style-type: none"> <li>Counterpart personnel</li> <li>Project Director</li> <li>Deputy Project Manager</li> <li>Officer in charge of Pilot Project</li> </ol> <p>(b) Technical personnel</p> <ol style="list-style-type: none"> <li>WTP &amp; Rising Main in Chandrawal Command Area</li> <li>Distribution network in Chandrawal Command Area</li> <li>Pipe network in Pilot Project area</li> <li>Pumping Station in Pilot project area</li> <li>SCADA</li> <li>GIS Mapping</li> <li>GIS Application</li> <li>RMS</li> <li>Civil in Pilot Project area</li> <li>E&amp;M in Pilot Project area</li> </ol> <p>2. Office Spaces and Facilities</p> <p>3. Permissions to access DSSDI and existing DJB's GIS data and necessary information</p> <p>4. Daily payment to CP: cost of operation</p> <p>5. Civil work for chamber construction</p> <p>6. Permission for construction from related authorities</p> <p>7. Civil work for improvement of chambers</p>	
<p>Precondition:</p> <ol style="list-style-type: none"> <li>DSSDI GIS data on utilities other than water pipelines can be used.</li> <li>The scope of "Delhi Water Supply Improvement Project" is not changed dramatically.</li> </ol>			

Notes: Unfixed figures (X and Y) in PDM shall be decided during activity 2-3-5

This PDM is approved at the 5<sup>th</sup> JCC. The "Duration of Period", however, becomes effective after approval of "Minutes of meetings for amendment of the record of discussions".

## Project Design Matrix(PDM)

Title of the Project: "The Assistance related to Delhi Water Supply Improvement Project"  
Project Area: Chandrawal Command Area and part of Pitampura area in Delhi  
Executing and Implementing Organization: Delhi Jal Board (DJB)  
Beneficiary: DJB

PDM ver. 5 as of July/2016  
Duration of the Project: four years and ten months from June 2013(June 2013 -March 2018)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
<p>&lt;Overall Goal&gt; To achieve the equitable and continuous water distribution in the National Capital Territory of Delhi, by improving the water supply network including service network to customers, thereby contributing in upgrading citizens living standard</p> <p>&lt;Project Purpose&gt; DJB's capacity to monitor, operate and maintain "Delhi water supply improvement project" is strengthened.</p> <p>&lt;Outputs&gt; 1. DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened. 2. DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded. 3. Draft of scenarios for stage wise development of GIS/RMS application in DJB is prepared 4. The assistance is managed and coordinated properly</p>	<p>Service hours in Chandrawal WTP command area to customers(hours/day) is 24 hours NRW ratio in Chandrawal WTP command area is less than 15%. Tariff collection ratio in Chandrawal WTP command area is more than 90%</p> <p>Basic information on pipe-networks is reflected in DPR for components 2-4 of "Delhi Water Supply Improvement Project" prepared by DJB. The gap among DMAs in water pressure and volume based on DMAs' demand is reduced. (Pressure: From X meters to Y meters, Volume: From Xm<sup>3</sup> per connection to Ym<sup>3</sup> per connection) Guideline for introduction of asset management based on scenarios for stage wise development of GIS/RMS application is reflected in DPR for component 5 of "Delhi Water Supply Improvement Project" prepared by DJB</p> <p>1a. Construction methods of pipe crossing (railways, rivers, and major roads) and laying method (Open-cut and Trenchless) for "Delhi Water Supply Improvement Project" are determined by DJB. 1b. Locations (alignment and depth) of transmission and distribution pipes for "Delhi Water Supply Improvement Project" are determined by DJB</p> <p>2a. DJB can control the water flow/pressure properly with SCADA based on the manuals and guidelines prepared by the assistance in the pilot project area 2b. NRW ratio is limited and continuously observed in the pilot project area</p> <p>3. Draft of guideline for introduction of asset management is prepared</p>	<p>Same as evaluation of "Delhi Water Supply Improvement Project"</p> <p>a&amp;c. Confirmation of contents of DPRs b. Report on water pressure and volume of DMAs</p> <p>1a. DJB's Authorization on construction method 1b. DJB's Authorization of Reports on pipeline route</p> <p>2a. Field Assessment by concerned experts 2b. Record on data of NRW ratio</p> <p>3. Minutes of Meeting on submission of draft of guideline on asset management to DJB</p>	<p>"Delhi Water Supply Improvement Project" is completed as planned.</p> <p>Consultants of "Delhi Water Supply Improvement Project" implement the detailed design work as scheduled.</p>

\*Note: . . Unfixed figures (X and Y) in PDM shall be decided during activity 2-3-5.

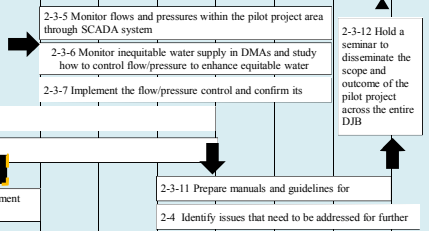
<Activities>	<Inputs> DJB Side	Precondition:
<p>[ ] Strengthening capacity to manage data and information on water supply facilities in Chandrawal command area</p> <p>1-1. Obtain necessary information for detailed design of Delhi water supply improvement project. 1-1-1. Review of data of existing pipeline. 1-1-2. Select pipelines to be replaced. 1-1-3. Review of results of "the Study on improvement of water supply system in Delhi" to install new pipes. 1-1-4. Obtain data and information on underground utilities by using DSSDI GIS data, and reconfirm pipeline network data with support of DJB field staff. 1-1-5. Draft pipe alignment and depth. 1-1-6. Draft pipe laying method (Open-cut and Trenchless) and crossing method (railways, rivers, drainage and major roads). 1-1-7. Carry out topographic survey along pipe-alignment. 1-2. Carry out survey and GIS mapping of WTPs, UGES and BFPs, and verification of the data (location and size, etc) of pipes in Chandrawal WTP command area.</p>	<p>1. Counterpart personnel (a) Management Personnel 1) Project Director 2) Project Manager 3) Deputy Project Manager 4) Officer in charge of Pilot Project (b) Technical personnel 1) WTP &amp; Rising Main in Chandrawal Command Area 2) Distribution network in Chandrawal Command Area 3) Pipe network in Pilot Project area</p>	<p>1. Water is delivered to UGR in the Pitampura pilot project area from the Haderpur Water Treatment Plant</p> <p>2. Pumps and other equipment run without major disruptions</p>
<p>[ ] Upgrading capacity to monitor and control the water distribution</p> <p>2-1. Review SCADA application in DJB 2-2. Introduce Japanese experience and system to DJB 2-3. Implement pilot project for equitable distribution and non-revenue (NRW) monitoring by applying SCADA 2-3-1. Reconfirm the configuration of the existing distribution network within the pilot project area and finalize the implementation plan of the pilot project 2-3-2. Estimate the level of water demand in each DMA 2-3-3. Procure equipment necessary for implementation of the pilot project 2-3-4. (a) Construct a demonstration chamber to check its performance (b) Implement improvement works for water ingress of the constructed chambers (c) Install the equipment and conduct trial runs of SCADA system 2-3-5. Monitor flows and pressures within the pilot project area through SCADA system 2-3-6. Monitor inequitable water supply in DMAs and study how to control flow/pressure to enhance equitable water supply 2-3-7. Implement the flow/pressure control and confirm its effectiveness 2-3-8. Calculate the total volume of water billed to the customers in the area based on the RMS 2-3-9. Calculate NRW ratio in the area 2-3-10. Demonstrate leakage detection activities in the area 2-3-11. Prepare manuals and guidelines for flow/pressure control and NRW monitoring 2-3-12. Hold a seminar to disseminate the scope and outcome of the pilot project across the entire DJB 2-4. Identify issues that need to be addressed for further enhancement of equitable distribution and NRW monitoring</p> <p>[ ] Draft of scenarios for stage wise development of GIS/RMS application in DJB</p> <p>3-1. Review existing DJB's management policy/vision and business plan 3-2. Clarify the issue to be tackled to achieve the above-mentioned policy /vision and plan 3-3. Review GIS development and Revenue Management System (RMS) in DJB 3-4. Study Japanese experience and system of GIS and RMS. 3-5. Draft GIS and RMS application scenario in DJB for year 2021 3-6. Draft GIS and RMS development scenario in DJB for year 2021 3-7. Draft the guideline as an action plan for realization of scenarios</p>	<p>4) Pumping Station in Pilot project Area 5) SCADA 6) GIS Mapping 7) GIS Application 8) RMS 9. Permissions to access DSSDI and existing DJB's GIS data and Necessary Information 10. Allowance and Running Expenses 11. Civil Works for Pilot Project 12. Permission from related authorities</p> <p>Japanese Side 1. Japanese Experts (1) Chief Advisor (2) GIS Application (3) Pipe-Network (4) GIS Mapping (5) SCADA (6) NRW Analyst (7) DMA (8) Leak Detection (9) Water Supply Management (10) Project Coordinator (11) Others (by Mutual consent) e.g. Civil Work 2. Local Experts 3. Equipment 4. Training of DJB personnel concerned with the Assistance in Japan 5. Seminars on Japanese water utilities in Delhi</p>	<p>1. DSSDI GIS data on utilities other than water pipelines can be used for the "Assistance Project". 2. The scope of "Delhi Water Supply Improvement Project" is not changed dramatically.</p>
<p>[ ] Assistance Management and Coordination</p> <p>0-1. Organize Joint Coordinating Committee (JCC) meeting at least once a year 0-2. Finalize the indicators of the PDM and the Plan of Operations (PO) for approval of the first JCC meeting 0-3. Prepare a draft Annual Plan of Operations (APO) based on the PO and an annual progress report for review by JCC for approval of the JCC 0-4. Monitor the progress and achievement of the Assistance based on PO/APO and the indicators of the PDM through JCC</p>		



Year	1st Year							2nd Year												3rd Year																
	2013							2014												2015								2016								
	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May
Number of month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Location	Japan	India																																		
<b>Output 1:</b> DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened.	1-1 Obtain necessary information for detailed design of Delhi water supply improvement project.																																			
	1-1-1 Review of data of existing pipeline. 1-1-3 Review of results of "the Study on Improvement of water supply system in Delhi" 1-1-4 Obtain data and information on underground utilities by using DSSDI GIS data, and reconfirm pipeline network data with support of DJB field staff 1-1-2 Select pipelines to be replaced. 1-1-5 Draft pipe alignment and depth. 1-1-6 Draft pipe laying method (Open-cut and Trenchless) and crossing method (railways, rivers, drainage and major roads). 1-1-7 Carry out topographic survey along pipe-alignment. 1-2 Carry out survey and GIS mapping of WTPs, UGEs and BPSs, and verification of the data (location and size, etc) of pipes in Chandrawal WTP command area.																																			
<b>Output 2:</b> DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded.	2-1 Review SCADA application in DJB 2-2 Introduce Japanese experience and system to DJB 2-3 Implement pilot project for equitable distribution and non-revenue (NRW) monitoring by applying SCADA 2-3-1 Reconfirm the configuration of the existing distribution network within the pilot project area and finalize the implementation plan of the pilot project 2-3-2 Estimate the level of water demand in each DMA 2-3-3 Procure equipment necessary for implementation of the pilot project Procurement by JICA side and DJB side 2-3-10 Demonstrate leakage detection activities in the area Conterpart training in Japan and OJT in Pitampura 2-3-8 Calculate the total volume of water billed to the customers in the area based on the RMS 2-3-9 Calculate NRW ratio in the area 2-3-4 (a) Construct a demonstration chamber to check its performance, (b) Implement improvement works for water																																			
	3-1 Review existing DJB's management policy/vision and business plan 3-2 Clarify the issue to be tackled to achieve the above-mentioned policy 3-3 Review GIS development and Revenue Management System (RMS) 3-4 Study Japanese experience and system of GIS and RMS 3-5 Draft GIS and RMS application scenario in DJB for year 2021 3-6 Draft GIS and RMS development scenario in DJB for year 2021 3-7 Draft the guideline as an action plan for realization of scenarios Guideline and Management Plan to be submitted to DJB																																			
Training in Japan	C/P Training																																			
Seminar	1st, 2nd, 3rd, 4th																																			
Reports	• Work Plan (1st Year) • Progress Report • Work Plan (2nd Year) • Progress Report • Progress Report • Work Plan (3rd Year) • Progress Report • Progress Report																																			
Project Evaluation Mission																																				

Year	4th Year												5th Year											
Year	2016						2017						2018											
Month	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March		
Number of month	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58		
Location	India																							
<p><b>Output 1:</b> DJB's capacity to manage data and information on water supply facilities in Chandrawal command area is strengthened.</p>																								
<p><b>Output 2:</b> DJB's capacity to monitor and control the water distribution for equitable distribution and non-revenue water management is upgraded.</p>																								
<p><b>Output 3:</b> Draft of scenarios for stage wise development of GIS/RMS application in DJB is prepared.</p>																								
Training in Japan																								
Seminar																								
Reports	★ •Work Plan (4th Year)	★ •Progress Report						★ •Progress Report						★ •Work Plan (5th Year)	★ •Progress Report						★ •Completion Report			
Project Evaluation Mission		★ •Mid-term Review																	★ •Final Review					









Contents







The Assistance related to Delhi Water Supply Improvement Project  
 デリー上水道運営・維持管理能力強化プロジェクト

	NAME		PRESENT POST
1		Mr. Amit Satija	Additional CEO, Director (Finance) Project Management, Administration & Finance Division, Delhi Jal Board  デリー上下水道公社
2		Mr. Ravindra Singh Negi	Chief Engineer (Water) Project Division, Delhi Jal Board  デリー上下水道公社
3		Mr. Balwan Singh Jaglan	Director Bottling plant Division, Delhi Jal Board  デリー上下水道公社
4		Mr. Vikram Singh	Superintending Engineer Project (Water) & Mapping Cell/IT Division, Delhi Jal Board
5		Mr. Ajay Gupta	Superintending Engineer (Civil) Superintendent Engineer (Central) Division, Delhi Jal Board  デリー上下水道公社
6		Mr. Ajay Kumar Gupta	Superintending Engineer Ground Water Cell and Planning (Water) Division, Delhi Jal Board  デリー上下水道公社
7		Mr. Chander Parkash	Executive Engineer Mapping Cell Division, Delhi Jal Board  デリー上下水道公社
8		Mr. Naresh Kumar	Deputy Director Revenue Division, Delhi Jal Board  デリー上下水道公社

**Schedule  
of  
Counterpart Training for The Assistance related to Delhi Water Supply Improvement Project**

	Month Day	Time	Subject	Target
1	Nov.9 (Sun)	7:20	Arriving at Tokyo (JAL740)	
2	Nov.10 (Mon)	10:00 – 11:30	Orientation by JICA	
		13:30 – 14:00	<u>Courtesy call</u> Japan Water Works Association	
		15:00 – 15:30	<u>Courtesy call</u> President of Tokyo Water Service Co., Ltd.	
		15:30 – 17:00	<u>Lecture &amp; Discussion</u> For Realizing 24 × 7 Stable Water Supply in Delhi Jal Board	Introduce summary (NRW, SCADA, Asset management, Customer service, and so on)
		17:30 –	<u>Welcome Party</u>	
3	Nov.11 (Tue)	9:30 – 12:00	<u>Visiting</u> Misono WTP	WTP SCADA (operation and maintenance), Advanced water treatment (ozonation and biological activated carbon adsorption treatment)
		14:00 – 15:30	<u>Visiting</u> Koemon Water Supply Station	Distribution SCADA (O&M), Equal water supply
4	Nov.12 (Wed)	9:30 – 11:00	<u>Visiting</u> Water Supply Operation Center @ TMWB	Equitable distribution by SCADA, 24 × 7water supply
		13:00~14:00	<u>Visiting &amp; Lecture</u> Customer Center @TMWB	Customer service
		14:00 – 14:30	<u>Visiting</u> Water meter reading	water meter reading
		15:30 – 16:30	<u>Visiting</u> Shinjuku service station @TMWB	Customer service, Collecting of water charge
5	Nov.13 (Thu)	9:30 – 12:00	<u>Lecture</u> NRW reduction (Leakage prevention in Japan and prevention measure)	NRW reduction, Water leak prevention
		13:00 – 15:00	<u>On the Job Training</u> Leak detection activity @ Training and development center in TMWB	Leak Detection activity
6	Nov. 14 (Fri)	9:30 – 12:00	<u>Lecture</u> SCADA System (SCADA feature and SCADA application for waterworks) Information and control systems Omika Works @HITACHI	SCADA
		13:00 – 15:00	<u>On the Job Training</u> SCADA System (SCADA operation by demonstration) Information and control systems Omika Works @HITACHI	SCADA
7	Nov.17 (Mon)	10:00 – 12:00	<u>Visiting</u> Ductile Iron Pipe factory @KUBOTA Corporation	Production of water pipe
		13:00 – 14:00	<u>Lecture</u> GIS application (GIS utilization in Japan, GIS application for waterworks, etc.)	GIS mapping
		14:00 – 17:00	<u>On the Job Training</u> Hydraulic analysis for pipeline design, O&M, etc. @KUBOTA Funabashi plant	
8	Nov.18 (Tue)	9:30 – 11:30	<u>Visiting</u> Construction site of water distribution pipe	Construction management
		13:30 – 14:00	<u>Courtesy call</u> Director general of Waterworks Bureau of Tokyo Metropolitan Government	
		14:00 – 16:30	<u>Discussion</u> Discussion about the future of DJB, Wrap-up of this training, Q&A, request the theme covered in next seminars, etc...	
9	Nov.19 (Wed)	11:50	Leave for Delhi (JAL749)	

**Main subject and Purpose  
of  
Counterpart Training for The Assistance related to Delhi Water Supply Improvement Project**

Theme	Training Subject	Purpose and Expected Outcome	Lecturer
NRW	<p><u>Visiting and OJT</u> Shinjuku service station @ TMWB</p>	<p>[Customer service, Collecting of water charge and Water meter reading] The service stations offer such services as answering inquiries, receiving various applications, and claiming water charges. Understanding the role of these, and learning importance of a reliable collecting of water charge by attending the meter reading.</p>	<p>Mr. Kenji Ozawa Manager of Shinjuku Service Station, West Branch Office Bureau of Waterworks Tokyo Metropolitan Government</p>
	<p><u>Lecture</u> NRW reduction, Water leak prevention, OJT of leak detection activity</p>	<p>[NRW reduction, Water leak prevention, OJT of leak detection activity] Review of leak detection demonstration of last August. And explaining another leak detection technology that could not be introduced at the time of the demonstration. Furthermore, Learning the emergency measure of water leakage at the time of the accident distribution pipe.</p>	<p>Mr. Hiroki Horie Head Engineer, Pipeline Management Division 1st Pipeline Section Mitaka Branch Office TSS Tokyo Water Co.,Ltd.</p>
	<p><u>OJT</u> Leak detection activity</p>		<p>Mr. Tetsuo Hayashi Supervisor Tama Pipeline Division Tachikawa Office TSS Tokyo Water Co.,Ltd.</p>
GIS/RMS	<p><u>Lecture</u> GIS application (GIS utilization in Japan, GIS application for waterworks, etc)</p>	<p>[GIS Mapping] To take advantage of even Delhi GIS utilization example of Japan, Introducing practical examples of GIS in Japan and GIS applications at Kubota Funabashi Plant. In addition, learning about the following by using a GIS demonstration machine actually. – Basic operation – Application operations such as hydraulic analysis – Performed case studies it is assumed that such an accident</p>	<p>Mr. Hiroshi Izumoto KUBOTA Corporation Tokyo Head Office International Business Promotion Project Team Water &amp; Environment Business Promotion Headquarters</p>
	<p><u>OJT</u> GIS application (Basic operation, Hydraulic analysis for pipeline design, O&amp;M using GIS Mapping)</p>		
	<p><u>Visiting</u> Ductile iron pipe factory @KUBOTA Corporation</p>	<p>[Water pipe] Visiting the manufacturing site of ductile iron pipe with high quality.</p>	
	<p><u>Visiting</u> Construction site of water distribution pipe</p>	<p>[Construction management of distribution pipe and service pipe] Visiting the site of construction replacement of water distribution pipe and service pipe. And learning the importance of construction management for quality, safety, and take advantage of the construction work in Delhi.</p>	<p>Mr. Tomoyuki Tanimoto Director, Water Supply Section, East Area First Branch Office Bureau of Waterworks, Tokyo Metropolitan Government</p>
	<p><u>Visiting &amp; Lecture</u> Customer Service Center @TMWB</p>	<p>[Customer service, Collecting of water charge and water meter reading] Learning about the following at the Customer Service Center. To respond to the reception of service start, service stop, repair, and the various inquiries from customers, Customer Service Centers was established. And TMWB has also introduced an on-line system to quickly respond to inquiries on charge, applications of the start-/stop of service, etc.</p>	<p>Mr. Suzuki Koichi Public Utility Services Center Co.,Ltd.</p>

Theme	Training Subject	Purpose and Expected Outcome	Lecturer
SCADA	<p>Visiting Misono WTP</p>	<p>[WTP SCADA (O&amp;M), Advanced water treatment] Misono WTP supplies safty and delicious water to users in 24 hours, by appropriate and efficient facilities and water quality management. Understanding these mechanisms, learning effective O&amp;M using SCADA, and Advanced water treatment.</p> <p>*In advanced water treatment, ozonation and biological activated carbon adsorption treatment are incorporated into the rapid sand filtration method, and this treatment is effective for the elimination of substances that cause a musty odor and trace organic substances.</p>	<p>Mr. Tadashi Okamura Manager of Misono Water Treatment Plant Bureau of Waterworks Tokyo Metropolitan Government</p>
	<p>Visiting Koemon Water Supply Station</p>	<p>[Distribution SCADA (O&amp;M), Equal water supply] The Water Supply Station is operated to control the transmission and distribution of water by adjusting the amount and pressure of water according to changes in demand. Understanding the role of these, and learning the importance of equal water supply and learning effective and perfect O&amp;M using SCADA</p>	<p>Mr. Kenji Ishida Manager of Koemon Water Supply Station TSS Tokyo Water Co., Ltd.</p>
	<p>Visiting Water Supply Operation Center @ TMWB</p>	<p>[Equitable distribution by SCADA, 24 x 7water supply] In Water Supply Operation Center, the center collects and distributes data using the water supply control and management system that consists of computers and communication equipment. Additionally, it performs full-time monitoring 24hour/day for efficient water supply control and management according to changing demand. Learning the role of Water Supply Operation Center, and Understanding the work into the monitoring room actually.  <ul style="list-style-type: none"> <li>- The water management in response to demand and efficiently using SCADA.</li> <li>- The importance of constant monitoring by SCADA quick response to be able to at the time of abnormality.</li> </ul> </p>	<p>Mr. Eiichi Uchida Director of Water Supply Operation Section, Water Supply Operation Center Bureau of Waterworks Tokyo Metropolitan Government</p>
	<p>Lecture SCADA System (SCADA feature and SCADA application for waterworks) Information and control systems Omika Works @HITACHI</p>	<p>[SCADA] Understanding water management and water distribution control SCADA. And Learning the actual operation (Remote control water flow and water pressure) and prediction work of water demand from the data that has been accumulated using the demo machine.</p>	<p>Mr. Manabu Fukushima Senior Engineer, Electric &amp; Control System Department Water &amp; Environment Solutions Division Hitachi, Ltd., Infrastructure Systems Company</p>
	<p>OJT SCADA System (SCADA operation by demonstration) Information and control systems Omika Works @HITACHI</p>		<p>Ms. Kanako Terasawa Mr. Motoaki Oguma Public Control Systems Engineering Department Electrical Equipment Information &amp; Control Systems Division Hitachi, Ltd., Infrastructure Systems Company</p>



## CERTIFICATE OF HANDOVER

To: JICA India Office

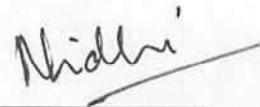
Re: Contract on Supply, Installation and Commission of Valves, Flow Meters, Pressure Gauges and Design, Installation and Commissioning of SCADA System for Assistance related to Delhi Water Supply Improvement Project

This certificate of handover is to certify that the facility listed below for above-mentioned contract has been handed over properly to Delhi Jal Board (DJB), as of December 14, 2017.

Simultaneously, JICA might be requested to support DJB's maintenance, when deemed necessary, but not after 15 March, 2018.

- Name of the Facility : SCADA System and Valves, Flowmeters, Pressure Gauges and related fittings as per attached sheet.
- General Description of the Facility : Facility for improvement of Water Supply in Delhi

December 14, 2017



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**Ms. Nidhi Srivastava**  
Addl. Chief Executive Officer  
Delhi Jal Board (DJB)

for witness



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**Momose Kazufumi**  
Chief Advisor  
Project for Assistance related to Delhi  
Water Supply Improvement in  
Chandrawal Water Treatment Plant  
Command Area (JICA Technical  
Assistance Team)


## Items for Handover

## SCADA Centre

S.N.	Description	Nos.
(a)	<b>SCADA System</b> installed at Control Room, Pitampura UGR & Booster Pumping Station (BPS)	
(i)	Server PC(Windows server with peripheral devices) (SACADA server, Data Collection server) DJB field office at Pitampura and SCADA control room at Pitampura PS	2
(ii)	Desktop PC (PC, 21 LCD monitor) DJB field office at Pitampura and SCADA control room at Pitampura PS	2
	Desktop PC (PC, 21 LCD monitor and color LBP) CE office and EE office at Pitampura in addition to at Pitampura UGR & BPS	3
(iii)	UPS (1hour protection) CE office and EE office at Pitampura in addition to at Pitampura UGR & BPS	3
(iv)	SCADA application software	1
(v)	PLC & I/O (A/I and D/I at UGR)	1
(vi)	Upgrading existing PLC & MCCB panel	1
(vii)	Data Collection Application Software	1
(viii)	Reporting System Application Software	1
(ix)	Pipe Network Calculation Application Software	1
(x)	Router, Ethernet Switch, Any other network equipment, etc.	3
(xi)	Printer and Power Branch panel	3

## Outside Location Equipment

S.N.	Description	Nos.	S.N.	Description	Nos.
<b>(b) Pressure Gauges</b>			<b>(c) SCADA Components</b>		
1	Pressure Gauges	21	1	PLC with peripheral devices	14
			2	Valve Control circuit, outdoor type	14
			3	Wireless transmission unit	14
<b>(d) Control Valves with Actuators</b>			<b>(e) Flow meters</b>		
1	Pipe diameter 100mm	1	1	Pipe diameter 100mm	1
2	150mm	3	2	150mm	3
3	200mm	2	3	200mm	3
4	250mm	2	4	250mm	2
5	300mm	1	5	300mm	1
6	500mm	2	6	500mm	2
7	800mm	1	7	800mm	1
8	900mm	1	8	900mm	1
<b>(f) Electricity Leakage Protection</b>					
1	Water level alarm system	14	2	Earth leakage circuit breaker	14

 B.

## CERTIFICATE OF HANDOVER

To: JICA India Office

Re: Procured Items under Assistance related to Delhi Water Supply Improvement Project

This certificate of handover is to certify that equipment listed below has been handed over properly to Delhi Jal Board (DJB), as of January 29, 2018.

- Name of the Facility : Desktop, Printer, Plotter, Pipe Locator and etc. as per attached sheet.
- General Description of the Equipment : Equipment for improvement of Water Supply in Delhi

January 29, 2018

*Nidhi*

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**Ms. Nidhi Srivastava**  
Additional CEO and Dir. Revenue  
Delhi Jal Board (DJB)

for witness

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**Momose Kazufumi**  
Chief Advisor  
Project for Assistance related to Delhi  
Water Supply Improvement in  
Chandrawal Water Treatment Plant  
Command Area (JICA Technical  
Assistance Team)

## Items for Handover

S.N	item	Description	Nos.	Place
1	PC (Desktop)	OS: Windows 7 Professional Office: Microsoft Office 2010 Professional CPU: Core i7 HDD: 500GB, Memory 8GB 24 inch screen, Keyboard, Mouse, including Anti-Virus Software	2	1 in JET Room and 1 in Mapping Cell, DJB
2	UPS	UPS CS 650, APC for Desktop PC mentioned above	2	Same as above
3	Printer (A3 inkjet)	HP-7500, Color	1	JET Room
4	Plotter	HP Design Jet 510 42 inch	1	DJB Mapping Cell
5	GPS	Trimble Juno 3B	1	JET Room
6	Arc Pad	Arc Pad ver10.0	1	JET Room
7	Arc GIS	Arc View Ver. 10.1	1	JET Room
8	Auto CAD	Auto CAD 2014	1	JET Room
9	Pipe Locator	MXL DLV, Multi Frequency High Precision Pipe and Cable Locator	4	JET Room
10	Pipe thickness gauge	MX-5 DL Material Thickness Gauge	2	JET Room

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