



Bihar Urban Infrastructure Development Corporation Ltd

(A Govt. of Bihar Undertaking)

303, Maurya Tower, Maurya Lok Complex, Patna-800 001

Tel – 0612-2506109, Fax No- 0612-2506132, Website : <http://buidco.in>

No.BUIDCo/PMU(ADB Project) Yo-85/15 - 103

Date: 12-May-2016


Sub: Addendum No. 01 under Bidding Document for Improvement of Water Supply System in Gaya Municipal Corporation under Contract Package No. GA/WS/01

Bid Ref No.: 1. Invitation of Bid No. BUIDCo/BUDIP-2/ICB/01
2. NIT No. BUIDCo/PMU(ADB Project) Yo-85/15-01 dt 17.3.2016

The Bidding Document of Contract Package No GA/WS/01 is modified as per the enclosed Addendum No. 01. This modification is as per the Clause 8 of Section 1: Instructions to Bidders. The Bidding Document stands modified as per this Addendum and the Addendum shall be part of Bidding Document.

All prospective bidders are requested to incorporate the clarification and Addendum while submitting the Bids and submit duly signed copy of Addendum along with their technical bid.

Encl: As above



Additional Program Director
ADB, BUIDCo, Patna

Memo No. 103

Date: 12-May-2016

Copy to:

- Chief General Manager, BUIDCo
- Executive Engineer, PIU, ADB Project, Gaya
- Manager (IT), BUIDCo, for uploading the same on website.
- All Prospective Bidders....


Additional Program Director
ADB, BUIDCo, Patna

Bid Ref No: BUIDCo/BUDIP-2/ICB/01

Contract Package No: GA/WS/01

Package Name: Improvement of Water Supply System in Gaya Municipal Corporation

Addendum 1

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
1.	2.4.2; Section 3 – Evaluation and Qualification Criteria	Experience in Key Activities	1. Redevelopment of at least 10 tube wells having cumulative production capacity of 15 MLD within the last seven years.	1. Development/Redevelopment /Installation of at least 10 tube wells within the last seven years.
2.	ITB 11.3 (d) section 2		ITB 11.3 (d) The Bidder shall submit with its Price Bid the following additional documents: NIL	ITB 11.2 (g) The Bidder shall submit with its Price Bid the following additional documents: NIL
3.	1.5.3, Subsection 1, Volume 2.8, Section 4, Volume 1 and 9.5.1.1.3, Section 2, Volume 2 9.5.1.1.3 (ii) , Section 2 Volume 2	Technical Schedule to be provided		Technical schedule added as Schedule A to sec 4A (Technical Bid) is at Annexure 1 to this addendum
4.	Section 4: Preamble to BOQ; 1.8 Contract Price		The contractor will have to ensure all his equipment/machinery, staff including skilled and unskilled labour and protection against damages to third party for which he will have to provide insurance policies to cover	The contractor will have to ensure all his equipment/machinery, staff including skilled and unskilled labour and protection against damages to third party for which he will have to provide

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as								
	2 nd para		up all of above, and will be reimbursed on production of actual payment receipts. Moreover he will renew the policies before their expiry. It is mandatory to comply with the condition, otherwise he will not be allowed to proceed with the work.	insurance policies to cover up all of above. Moreover he will renew the policies before their expiry. It is mandatory to comply with the condition, otherwise he will not be allowed to proceed with the work.								
5.	Bill No.5, Item No.5.8, Section 4, BOQ Volume 1	Ductile iron pipe	<table border="1"> <tr> <td>Ductile Iron (DI) K-9 Pipes - for Rising Main System</td> <td>Ductile Iron (DI) K-9 Pipes - for Rising Main System</td> </tr> <tr> <td>..... laboratory. Ductile Iron Class K-7pipes</td> <td>..... laboratory. Ductile Iron Class K-9 pipes</td> </tr> </table>	Ductile Iron (DI) K-9 Pipes - for Rising Main System	Ductile Iron (DI) K-9 Pipes - for Rising Main System laboratory. Ductile Iron Class K-7pipes laboratory. Ductile Iron Class K-9 pipes	<table border="1"> <tr> <td>Ductile Iron (DI) K-9 Pipes - for Rising Main System</td> <td>Ductile Iron (DI) K-9 Pipes - for Rising Main System</td> </tr> <tr> <td>..... laboratory. Ductile Iron Class K-9 pipes</td> <td>..... laboratory. Ductile Iron Class K-9 pipes</td> </tr> </table>	Ductile Iron (DI) K-9 Pipes - for Rising Main System	Ductile Iron (DI) K-9 Pipes - for Rising Main System laboratory. Ductile Iron Class K-9 pipes laboratory. Ductile Iron Class K-9 pipes
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6.	Bill No.5, Item No.5.8 & Bill No.6, Item No.6.8 and 6.9.1 Section 4, BOQ Volume 1	DI pipes for Transmission System & DI pipes for Distribution System	“..... including disinfecting C.I. water mains.....”.	“..... including disinfecting DI water mains.....”.								
7.	Bill No.5, Item No.5.10 & Bill No.6, Item No.6.10.1 Bill No 7 Item No 7.1.17 and 7.2.17 of BOQ Section 4	Specials for proposed DI Pipes	“Ductile Iron K - 12 specials suitable for push on jointing including Laying in position S&S or flanged C.I. special such as tees, bends, collars, tapers and caps etc.(excluding cost of specials).....”	“Ductile Iron K - 12 specials suitable for push on jointing including Laying in position S&S or flanged D.I. special such as tees, bends, collars, tapers and caps etc.(including cost of specials).....”								
8.	Bill No 6.10.2 of BOQ Section 4	Specials for proposed DI Pipes	Ductile Iron K - 12 specials suitable for push on jointing including Laying in position S&S or flanged C.I. special such as tees, bends, collars, tapers and caps etc.(excluding cost of specials).....”	Ductile Iron K - 12 specials suitable for push on jointing including Laying in position S&S or flanged D.I. special such as tees, bends, collars, tapers and caps etc.(including cost of specials).....”								

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9.	Bill No.6, Item No.6.9.1, Section 4 BOQ	HDPE pipes for Distribution System	“.....at and jointing at all level/ depths ISI marked HDPEpipes of PE-100 grade & PN-6 for”	“.....at and jointing (with electro-fusion joints) at all level/ depths ISI marked HDPEpipes of PE-100 grade & PN-6 for”
10.	Bill No.8, Item No.8.2, Section 4, BOQ Volume 1	House Service Connections	.....Engineer (6) Providing, installing and giving satisfactory field testing of AMR type water meter, horizontal inferential multiset type with magnetic drive and dry dial suitable for .....	.....Engineer (6) Providing, installing and giving satisfactory field testing of AMR type water meter, horizontal inferential multi-jet type with magnetic drive and dry dial suitable for
11.	Section 4: Vol-1 Bidding document-4	BillNo:15		New Bill No. 15A; SCADA , FURNITURE AND EQUIPMENT is added and given at Annexure-2 to this addenda
12.	Section 4 BOQ Bill No 11 Title, Item 11	Bill No 11	Customer service center	Customer service center with control room at Dandibagh
13.	Section 4B, BOQ 4.117, Bill No 11, item No 11.34	Bill No 11	... Required fan, tube light, exhaust fan, water heater, Unit Nos Qty 16 Nos	----- required Nos of ceiling fans 6 Nos, Tube light with Luminaries 10 Nos, exhaust fan 1 no, water heater of capacity 50 litre 1 No, 1.5 Tone capacity split A.C 2 Nos, Outside bulk head fittings with tube light 1 no, required earthing, power points for computer and printers Unit No Qty 6 Nos
14.	Section 4 B BOQ Bill 4 item 4.2.21	Bill No 4	Internal lightings for pump rooms	Internal lighting with switch 3 Nos, 6 Ams 3 pin board 1 No, Metalic switch box 1 No, 4 sqm cable 30 m, 32 Amps fuse unit, CFL 36 W Bulb 2 Nos, Tube light with Luminaries 2 No, Bulkhead fitting with tube light for out side the pump room etc., complete for one pump room
15.	Section 4B BOQ, 4.106 Bill No 10 Item No 10.1	Bill No 10	.... Location specified by the employer including	----- location specified by the employer with the following 1. Digital input &out put 2.Analog inputs for monitoring of Temperature and Humidity 3.Local display membrane key board and data storage

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
				4.Compactibility with GSM Modem 5. GSM based wireless communication for RTU 6Presuure Transmitters with SS body and out of 4 to 20 mArange 0 to 10 Bar 6.Isolation transformers of capacity 300 VA with surge arrestor and required capacity of UPS including programme unit, cost of SIM Cards, obtaining 230 V Power supply.....
16.	Section 4B BOQ 4.33 Bill No 2 item No 2.1.28	Bill No 2	----- 150 mm dia C.I Double Flanged Pipe	---- 150 mm dia D.I Double Flanged Pipe
17.	Section 4B BOQ 4.147 Bill No 14 Item No 14.13.3	Bill No 14	.... Reservoir with conduit wiring .....	..... reservoir site with underground/overhead cabling providing tube lights in the four corners and in the entrance of the reservoir site
18.	Section 4B BOQ 4.133 Bill No.13 Item No 13.2	Bill No. 13	Vertical Hollow Shaft Motor as per IS: 9283-1995 and as per specification and suitable for pumps duty condition, 1500 rpm, 90 KW	Supply, delivery erection and commissioning of Energy efficient Vertical Hollow Shaft Motor as per IS: 325 suitable for 400 V, 1500 RPM, 50 Hz and suitable for Vertical Turbine pump and as per specification and suitable for pumps duty condition, 90 KW
19.	Section 4 B BOQ 4.415 Bill No 14 Item No 14.10 and 14.11	Bill No 14	.....with aluminium conductor.....	.....with copper conductor.....
20.	Section 4B BOQ Bill No 14 item No 14.2.2	Bus bar	....630A colour coded heat shrinkable sleeved TP Aluminium (Electrolyte grade).....	.....electrical grade Copper of high conductivity and non-segregated type.....
21.	Section 4B BOQ Bill No 2 Item No 2.1	Bill No. 2	Refurbishment of existing service Reservoirs	Add following at the end Bill No 2.1 after GLSR Bhrammayoni " GLSR at Shringhsthan "
22.	Section 6.2 Employer		..... Within 6 months .....	..... within a month.....

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
	requirement 6.35			
23.	Table 2.8.1 Summary of periodic reporting requirements Section 6 Page 6.36	Construction plan	Submit Draft Construction Plan not later than 3 months from the Commencement Date. The Final Construction Plan should be approved not later than 6 months from the Commencement Date	Submit Draft Construction Plan not later than 1 month from the Commencement Date. The Final Construction Plan should be approved not later than 1 month from the Commencement Date
24.	Para 168 of section 6 Page 6.37	Construction plan	The Construction Plan shall be finalized and approved within 6 months from the Commencement Date.	The Construction Plan shall be finalized and approved within a month from the Commencement Date
25.	Para 24 of section 6 page 6.10	Construction plan	A draft of the three Plans shall be submitted by the Contractor to the Engineer at least three (3) months from the Commencement Date for review and comments by the Employer. Any comments on the Plans will be furnished within one (1) month from receipt of the draft Plans and the final Plans shall be submitted by the Contractor at least five (5) months from the Commencement Date for approval.	The construction Plan shall be submitted by the Contractor to the Engineer at before one month from the Commencement Date for review and comments by the Employer. And has to approved within a month from the commencement date. The Operation and maintenance and training plan shall be submitted with 3 months and it has to approved with in 6 months from the commencement date.
26.	Technical specification Volume 2 Part 1 Clause 4.8 and 4.9	Technical specification for RCC pipe and House service connection and specification of soft ware to be provided		Add sub clause No 4.8 and 4.9 at end of Vol II part I page 82 available at annexure-3 to this addendum.
27.	Section 6 para 11, para 28, para 30		....Design .....	....Drawing.....

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
	And para 53			
28.	2.6.1 (112) , Section 6, Volume 1	Water quality	The Contractor shall supply treated water that complies with the CPHEEO norms, presented in Schedule 3of Section 8 [<i>Particular Conditions of Contract</i>].	The contractor shall supply water with minimum residual chlorine level of 0.2 PPM at the consumer end
29.	2.5.6.97 section 6, volume 1	Bulk water connections	.....The responsibility for providing saddles, service pipe, water meter and stop cock as per specifications will be of the Consumer but installation of saddle to the distribution main pipe and making connection and installation of water meter will be done by the Contractor.	....The responsibility for providing saddles, service pipe, water meter and stop cock as per specifications will be of the Contractor including installation of saddle to the distribution main pipe and making connection and installation of water meter.
30.	Technical specification part I of VOL2 WORKS Para 4.5.8.10	4.5.18.10 Welding Procedure	Jointing between HDPE pipes and specials shall be done as per the latest IS: 7634 part II. Method of jointing between the pipes to pipes and pipes to specials shall be with butt fusion welding using automatic or semi-automatic, hydraulically operated, superior quality butt fusion machines which will ensure good quality butt fusion welding of HDPE pipes. If approved by the concerned Engineer, jointing with PP compression fittings may be carried out for smaller diameters of PE pipes (up to 110mm).	Jointing between HDPE pipes and specials shall be done as per the latest IS: 7634 part II. Method of jointing between the pipes to pipes and pipes to specials shall be with good quality of Electro fusion welding of HDPE pipes. If approved by the concerned Engineer, jointing with PP compression fittings may be carried out for smaller diameters of PE pipes (up to 110mm).
31.	Technical specification Volume 2 Part 1, 9.5.1.1.3, Page 255	Failure to Attain Guaranteed Discharge and Power Consumption	If during Performance Guarantee Tests, the discharge and energy power consumption of any of the pumps are found to be lesser than the guaranteed figures specified in Technical Schedule Section VII B; Volume 4,	If during Performance Guarantee Tests, the discharge and energy power consumption of any of the pumps are found to be lesser than the guaranteed figures specified in Technical Schedule Section 4A Volume 1
32.	Clause 6.9 Section 6 Volume 2 Part2	SCADA specification		Add new clause 6.9 in section 6 volume 2 part 2 Any reference made to requirement of remote and control of pumping machinery, electrical equipment valve etc in clause 6 above and requirement of hardware mentioned stands deleted.
33.	89, Volume 3	Table 11 : Efficiency	Efficiency of pumps 80% minimum	Efficiency of pumps 80% for VT Pump and 70% for submersible pumps
34.	1.16 volume 2	1.16 Electro chlorinator a dose of 3mg/l could be given to TW water..... a dose of 2mg/l could be given to TW water.....

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35.	6.8.5, Section 2, Volume 2 Part-1	Drawings and Data	6.8.5. DRAWINGS All Drawings, data, technical particulars, calculations, detailed literature, catalogues, test certificates etc shall be submitted by the contractor along with the bid as well as after award of contract	6.8.5 Deleted
36.	1.2 Subsection 1, Volume 2 Part 1 page 3	Completion time for refurbishment of Tube wells	The TW related all works will be completed in eighteen months' time from the initial take over date	The TW related all works will be completed in Twelve months' time from the date of commencement
37.	Section 8: Part B2 – Specific Provisions(Opera tion), Clause 4.a	Risk and Responsibility	“all risks resulting or arising from the design, material or workmanship of the Plant and Material supplied or construction of the Works or the materials used therein, notwithstanding any testing carried out by or witnessed by the Employer or the Engineer during the Works period; and”	“all risks resulting or arising from the material or workmanship of the Plant and Material supplied or construction of the Works or the materials used therein, notwithstanding any testing carried out by or witnessed by the Employer or the Engineer during the Works period; and”
38.	Section 8 Part C-Schedule: Clause 4.2.1 (B)Operation and maintenance of the existing distribution network	Payment for Operation & Maintenance	B. Operation and maintenance of the existing distribution network: MPedn = the quarterly payment for O&M of production and transmission;	B. Operation and maintenance of the existing distribution network: MPedn = the quarterly payment for O&M of existing distribution network;
39.	Section 8: Part– C-Schedule(3)	Price adjustment for Payment for Works(Part1)	1. Price Adjustment for Payment for Works (Part 1) All Contractor Payments for Construction works under this Contract shall be governed in accordance to the adjustments for change in costs as provided in GCC Sub-Clause 13.8	1. Price Adjustment for Payment for Works (Part 1) All Contractor Payments for Construction works under this Contract shall be governed in accordance to the adjustments for change in costs as provided in GCC Sub-Clause 13.8

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		<p>1.1. The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, No adjustment is to be applied to work valued on the basis of cost or current prices. The formulae shall be of the following general type: $P_n = a + b (L_n/L_o) + c (C_n/C_o) + d (S_n/S_o) + e(O_n/O_o)$ where “P_n” is the adjustment multiplier to be applied to the estimated contract value in the currency of payment of the work carried out in period “n”, this period shall be in quarter; “a” is a fixed coefficient stated in the table of adjustment data, representing a non-adjustable component of the multiplier “b”, “c”, “d”, and “e” are fixed coefficients, stated in the table of adjustment data, representing the estimated proportion of various adjustable components of the multiplier; “L_n”, “C_n”, “S_n”, and “O_n” are the current cost indices or reference price for period “n” expressed in the currency of payment, each of which is applicable to the tabulated cost element on 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and “L_o”, “C_o”, “S_o”, and “O_o” are the base cost indices or reference price, expressed in the currency of payment, each of which is applicable to the tabulated cost element on the Base Date.</p> <p>1.2. The cost indices or reference prices stated in Table A.1, table of adjustment data, provided in Section 4, shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the</p>	<p>1.1. The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, No adjustment is to be applied to work valued on the basis of cost or current prices. The formulae shall be of the following general type: $P_n = a + b (L_n/L_o) + c (C_n/C_o) + d (S_n/S_o) + e(O_n/O_o) + f(H_n/H_o) + g(B_n/B_o) + h(PM_n/PM_o)$ where “P_n” is the adjustment multiplier to be applied to the estimated contract value in the currency of payment of the work carried out in period “n”, this period shall be in quarter; “a” is a fixed coefficient stated in the table of adjustment data, representing a non-adjustable component of the multiplier “b”, “c”, “d”, “e”, “f”, “g” and “h”, are fixed coefficients, stated in the table of adjustment data, representing the estimated proportion of various adjustable components of the multiplier; “L_n”, “C_n”, “S_n”, “O_n”, “H_n”, “B_n”, and “PM_n” are the current cost indices or reference price for period “n” expressed in the currency of payment, each of which is applicable to the tabulated cost element on 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and “L_o”, “C_o”, “S_o”, “O_o”, “H_o”, “B_o”, and “PM_o” are the base cost indices or reference price, expressed in the currency of payment, each of which is applicable to the tabulated cost element on the Base Date.</p> <p>1.2. The cost indices or reference prices stated in Table A.1, table of adjustment data, provided in Section 4,</p>

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		<p>values of the indices at stated dates for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.</p> <p>Tables of Adjustment Data for Payment of Works</p> <p>Table A.1 - Local Currency:</p> <table border="1"> <thead> <tr> <th>Index Code</th> <th>Index Description</th> <th>Source of Index</th> <th>Base Value and Date</th> <th>Amount</th> <th>Weighting</th> </tr> </thead> <tbody> <tr> <td></td> <td>Nonadjustable</td> <td>—</td> <td>—</td> <td>—</td> <td>0.15</td> </tr> <tr> <td>a</td> <td>Labour Component (L):</td> <td>Consumer Price Index for labour issued by Reserve Bank of India</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.25</td> </tr> <tr> <td>b</td> <td>Cement (C)</td> <td>Wholesale Price Index for grey cement (OPC) issued by Reserve Bank of India</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.05</td> </tr> <tr> <td>c</td> <td>Bitumen (B)</td> <td>Wholesale Price Index for Bitumen issued by Mathura Refinery</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.05</td> </tr> <tr> <td>d</td> <td>Ferrous Metal (S)</td> <td>Wholesale Price Index for ferrous metal issued by Reserve Bank of India</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.10</td> </tr> <tr> <td>e</td> <td>HDPE/ PVC Pipes and specials (H)</td> <td>Wholesale Price Index for resin (HDPE / PVC pipes) issued by Reserve Bank of India</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.20</td> </tr> <tr> <td>f</td> <td>Pumps and Machinery and Spares (PM)</td> <td>Wholesale Price Index for Construction machinery issued by Reserve Bank of India</td> <td>Indices applicable on 28 days prior to deadline for bid submission</td> <td>As per cost of work</td> <td>0.05</td> </tr> </tbody> </table>	Index Code	Index Description	Source of Index	Base Value and Date	Amount	Weighting		Nonadjustable	—	—	—	0.15	a	Labour Component (L):	Consumer Price Index for labour issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.25	b	Cement (C)	Wholesale Price Index for grey cement (OPC) issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05	c	Bitumen (B)	Wholesale Price Index for Bitumen issued by Mathura Refinery	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05	d	Ferrous Metal (S)	Wholesale Price Index for ferrous metal issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.10	e	HDPE/ PVC Pipes and specials (H)	Wholesale Price Index for resin (HDPE / PVC pipes) issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.20	f	Pumps and Machinery and Spares (PM)	Wholesale Price Index for Construction machinery issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05	<p>shall be used. 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	Nonadjustable	—	—	—	0.15																																																																																								
a	Labour Component (L):	Consumer Price Index for labour issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.25																																																																																								
b	Cement (C)	Wholesale Price Index for grey cement (OPC) issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05																																																																																								
c	Bitumen (B)	Wholesale Price Index for Bitumen issued by Mathura Refinery	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05																																																																																								
d	Ferrous Metal (S)	Wholesale Price Index for ferrous metal issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.10																																																																																								
e	HDPE/ PVC Pipes and specials (H)	Wholesale Price Index for resin (HDPE / PVC pipes) issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.20																																																																																								

SN o.	Clause/Section Reference		Existing Provision						Amended. Now to be read as					
			g	Other Materials (O)	Wholesale Price Index for all commodities issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.15	f	Pumps and Machinery and Spares (PM)	Wholesale Price Index for Construction machinery issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.05
						Total	1.00					Total	1.00	
								g	Other Materials (O)	Wholesale Price Index for all commodities issued by Reserve Bank of India	Indices applicable on 28 days prior to deadline for bid submission	As per cost of work	0.15	
						Total	1.00							
40.	5; Part– C- Schedule(3)	Price Adjustment of payments for Operations	<p>All Contractor Payments shall be governed in accordance to the adjustments for change in costs as provided in GCC Sub-Clause 13.8.</p> <p>1.3. The adjustment to be applied to the amount payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of cost or current prices. The formulae shall be of the following general type: $P_n = a + b (L_n/L_o)$ In which, “P_n” is the adjustment multiplier to be applied to the estimated contract value in the currency of payment of the work carried out in period “n”, this period shall be in quarter; “a” is a fixed coefficient stated in the table of adjustment data, representing a non-adjustable component of the multiplier</p>						<p>All Contractor Payments shall be governed in accordance to the adjustments for change in costs as provided in GCC Sub-Clause 13.8.</p> <p>1.3. The adjustment to be applied to the amount payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of cost or current prices. The formulae shall be of the following general type: $P_n = a + b (L_n/L_o) + c (M_n/N_o)$ In which, “P_n” is the adjustment multiplier to be applied to the estimated contract value in the currency of payment of the work carried out in period “n”, this period shall be in quarter; “a” is a fixed coefficient of value 0.15, representing a non-adjustable component of the multiplier</p>					

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
			<p>“b”, fixed coefficients, stated in the table of adjustment data, representing the estimated proportion of adjustable components of the multiplier;</p> <p>“L_n” is the current cost index or reference price for period “n” expressed in the currency of payment, applicable to the tabulated cost element on 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and</p> <p>“L_o”, is the base cost index or reference price, expressed in the currency of payment, applicable to the tabulated cost element on the Base Date.</p> <p>Table of Adjustment Data is available in Section 4B.</p>	<p>“b”, fixed coefficients, of value 0.70, representing the estimated proportion of labour, adjustable components of the multiplier;</p> <p>“c”, fixed coefficients, of value 0.15, representing the estimated proportion of material, adjustable components of the multiplier;</p> <p>“L_n” and “M_n” is the current cost index or reference price for period “n” expressed in the currency of payment, applicable to the tabulated cost element on 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and</p> <p>“L_o” and “M_o”, is the base cost index or reference price, expressed in the currency of payment, applicable to the tabulated cost element on the Base Date.</p> <p>Table of Adjustment Data is available in Section 4B.</p>
41.	Clause 14.6: Section 8 PCC	Minimum Amount of Interim Payment Certificates	For IPC Part 1 – Works: 2% of the Contract Amount of Part 1. For IPC Part 2 – Operations: not applicable.	For IPC Part 1 – Works: Not applicable For IPC Part 2 – Operations: Not applicable
42.	Section 6: Annex 1 – Chapter VII – Environment Management Plan Para 246.	Initial Environmental Examination and Environmental Management plan		<p><i>Add following text at the end of para246:</i></p> <p>“The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations. The Contractor shall (a) comply with the measures relevant to the contractor set forth in the Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), the Environmental Management Plan (EMP) and any corrective or preventative actions set forth in a Safeguards Monitoring Report that the Employer will prepare from time to time to monitor implementation; (b) make available a budget for all such environmental and social measures; (c) provide the Employer with a written notice of any</p>

SN o.	Clause/Section Reference		Existing Provision	Amended. Now to be read as
				<p>unanticipated environmental impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE or EIA, the EMP and prepare required actions; (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction; and (f) submit to Employer monthly monitoring report on EMP Implementation. The IEE (including EMP) is attached hereto as Appendixes”.</p>

ANNEXURE 1 TO SECTION 4A

Technical Schedule

(To be completed by the Bidder)

1.0 Introduction

Technical Schedules cover only the few technical details of equipment offered by the bidder.

1.1.1 Submersible pumps

Description	Unit	Particulars as specified	Particulars to be provided by the contractor
Type		Submersible water filled	
Manufacturer			
Country of origin			
Model No.			
Pumpset total weight	kg		
Duty: capacity	l/s		
Duty head	m		
Rated power	kW	0-15 kW	
Efficiency	%		
Details of guide rail system:			
Materials:			
casing		Cast Iron FG 200 IS: 210	
impeller		Bronze grade LTB 2 of IS: 318 or Stainless steel grade X 12 Cr12 of IS 6911 or IS 6603 or glass filled Polyphenylene oxide (modified PPO) or glass filled Polycarbonate of IS 8034	
Guide rails			

1.1.2 Submersible pumps

Description	Unit	Particulars as specified	Particulars to be provided by the contractor
Type		Submersible water filled	
Manufacturer			
Country of origin			
Model No.			
Pumpset total weight	kg		
Duty: capacity	l/s		
Duty head	m		
Rated power	kW	16-25 kW	
Efficiency	%		
Details of guide rail system:			
Materials:			
casing		Cast Iron FG 200 IS: 210	
impeller		Bronze grade LTB 2 of IS: 318 or Stainless steel grade X 12 Cr12 of IS 6911 or IS	

		6603 or glass filled Polyphenylene oxide (modified PPO) or glass filled Polycarbonate of IS 8034	
Guide rails			

1.1.3 Submersible pumps

Description	Unit	Particulars as specified	Particulars to be provided by the contractor
Type		Submersible water filled	
Manufacturer			
Country of origin			
Model No.			
Pumpset total weight	kg		
Duty: capacity	l/s		
Duty head	m		
Rated power	kW	26-35 kW	
Efficiency	%		
Details of guide rail system:			
Materials:			
casing		Cast Iron FG 200 IS: 210	
impeller		Bronze grade LTB 2 of IS: 318 or Stainless steel grade X 12 Cr12 of IS 6911 or IS 6603 or glass filled Polyphenylene oxide (modified PPO) or glass filled Polycarbonate of IS 8034	
Guide rails			

1.1.4 Submersible pumps

Description	Unit	Particulars as specified	Particulars to be provided by the contractor
Type		Submersible water filled	
Manufacturer			
Country of origin			
Model No.			
Pumpset total weight	kg		
Duty: capacity	l/s		
Duty head	m		
Rated power	kW	36-45 kW	
Efficiency	%		
Details of guide rail system:			
Materials:			
casing		Cast Iron FG 200 IS: 210	
impeller		Bronze grade LTB 2 of IS: 318 or Stainless steel grade	

		X 12 Cr12 of IS 6911 or IS 6603 or glass filled Polyphenylene oxide (modified PPO) or glass filled Polycarbonate of IS 8034	
Guide rails			

1.1.5 Submersible pumps

Description	Unit	Particulars as specified	Particulars to be provided by the contractor
Type		Submersible water filled	
Manufacturer			
Country of origin			
Model No.			
Pumpset total weight	kg		
Duty: capacity	l/s		
Duty head	m		
Rated power	kW	More than 46 kW	
Efficiency	%		
Details of guide rail system:			
Materials:			
casing		Cast Iron FG 200 IS: 210	
impeller		Bronze grade LTB 2 of IS: 318 or Stainless steel grade X 12 Cr12 of IS 6911 or IS 6603 or glass filled Polyphenylene oxide (modified PPO) or glass filled Polycarbonate of IS 8034	
Guide rails			

The duty of pumping plant will be decided as per actual approved discharge and head as per site condition.

1.2 Vertical Pumps

S. No.	Particulars	Units	Particulars as specified	Particulars to be provided by the contractor
1.	Rated Discharge (Q)	Cum/Hr.	225	
2.	Design head (h)	M	85	
3.	Rated speed		1500	
	a) Pump	Rpm		
	b) Motor	Rpm	1500	

S. No.	Particulars	Units	Particulars as specified	Particulars to be provided by the contractor
4.	Pump Output (1) x (2) / 102	kW		
5.	Head loss in column assembly and discharge head	M		
6.	Head loss at suction strainer	M		
7.	Head loss at suction bell mouth	M		
8.	Bowl assembly head (H) = (2) + (5) + (6) + (7)	M		
9.	Bowl assembly output (1) x (8)/ 102	kW		
10.	Bowl efficiency	%		
11.	Input to bowl assembly (9)/ (10) x 100	kW		
12.	Power loss in thrust bearing	kW		
13.	Power loss in the line shaft bearing, stuffing box, flexible coupling and shaft losses.	kW		
14.	Input to pump (11) + (12) + (13)	kW		
15.	Pump efficiency (4) / (14)		Minimum 80%	
16.	Motor efficiency at load corresponding to rated conditions.	%	Minimum 90%	

S. No.	Particulars	Units	Particulars as specified	Particulars to be provided by the contractor
17.	Input to motor (14)/ (16) x 100			
18.	Guaranteed overall efficiency of pump-motor set (4)/ (17) x 100	%		
19.	NPSH required at operating head corresponding to highest water level with single pump operation	M		
20.	Minimum Submergence required at operating head corresponding lowest water level with single pump operation	M		
21.	Life of thrust bearing (calculations giving maximum hydraulic thrust encountered, capacity of thrust bearing etc. shall be enclosed to substantiate life of thrust bearing)	Hrs.	40,000	
22.	Material of Construction			
	Bell Mouth		Cast Iron: IS 210 Gr. FG 220	
	Bowl, Impeller Guide		Cast Iron: IS 210 Gr. FG 220	
	Impeller		Stainless Steel: ASTM A 351 CF8M	

S. No.	Particulars	Units	Particulars as specified	Particulars to be provided by the contractor
	Shafts		Stainless Steel: AISI 431	
	Shaft Sleeve with surface hardening of 350 BHN- min.		Stainless Steel: AISI 410	
	Transmission Shaft Couplings		Stainless Steel: AISI 410 / 431	
	Sleeve for Bearing		Stainless Steel: AISI 304	
	Suction Strainer		Stainless Steel: AISI 304	

The duty of pumping plant will be decided as per actual approved discharge and head as per site condition.

1.3 433V Motor Schedule

S. No.	Particulars	Units	Particulars as specified	Particulars to be provided by the contractor
1.	Pump head at which maximum power is required within specified working range of pump head (As specified in Section – 6)	M		
2.	Corresponding discharge	LPS		
3.	Corresponding pump efficiency	%		
4.	Maximum power required by pump $\frac{\{(1) \times (2)\}}{100} \times$	kW		

	102 (3)			
5.	Margin at 5 % over maximum power required by pump. (4) x 0.05	kW		
6.	Margin at 10 % over power required by pump at duty point	kW		
7.	Minimum motor rating required	kW		
8.	Rating of motor offered	kW		
9.	Efficiency		Minimum Eff -2 Category	

1.4 11/0.433 KV Transformer

Sr. No.	Description	Unit	Particulars as specified	Particulars to be provided by the contractor
1	Make			
2	Applicable standards		As per Paragraph 6.13.1	
3	Type/Designation			
4	Full load rating	MVA	1.0	
	Rated no- load voltages HV	kV	11	
5	LV	kV	0.433	
6	Guaranteed impedance voltage at rated current for all taps	%		
7	Guaranteed efficiency at 75 Deg C at unity P.F at full load	%		
8	External short circuit withstand capacity	MVA		
	Tappings on winding			
	On-load/off circuit taps			
9	Full power tapping range	%		
10	OFF load tap changer			

(a)	Make			
(b)	Type designation			
11	Minimum clearance height for lifting core and windings from tank	mm		
12	Bushings:			
(a)	Rated voltage class	kV		
(b)	Rated current	A		
(c)	Free space required at top for removal	mm		
13	Guaranteed no load losses (core loss and dielectric loss) at 100% rated voltage and frequency	kW		
14	Guaranteed no-load current:			
(a)	When excited from LV side at 100% rated voltage	A		
(b)	When excited from LV side at 110% rated voltage	A		
15	Wheels:			
(a)	Plain/flanged		Flanged	
(b)	Unidirectional/bidirectional		Bidirectional	
(c)	Quantity			
(d)	Gauge (s)			
16	Vacuum withstand capability:	mm of Hg.	Minimum 760mm of Mercury	
17	Weights			
(a)	Core winding assembly	Kg		
(b)	Oil	Kg		
(c)	Tank, Coolers and fittings			
(d)	Total	Kg		
(e)	Untanking weight	Kg		
18	Shipping section			
19	Size of largest package (L x B x H)	mm		
20	Weight of the largest package	Ton		
21	Hydraulic jack			
(a)	Make			
(b)	Type			
(c)	Number			
(d)	Capacity			
22	General outline drawing enclosed with the tender showing the transformer with all its fittings and	Yes/ No	Yes	

	accessories in plan, front and side elevations and other details			
23	Whether GA Drawings/ Documents/ Literature / Catalogues etc. as per Volume-2, Part-2 enclosed with the bid	Yes/ No	Yes	
24	Whether copies of type test certificates/ report as per the latest standards enclosed with the bid	Yes/ No	Yes	
25	Whether copies of user's certificates enclosed with bid	Yes/ No	Yes	
26	Whether all routine/type/acceptance tests will be carried out as specified (If not, furnish list)	Yes/ No	Yes	

1.5 Starter

Sr. No.	Description	Unit	Particulars as specified	Particulars to be provided by the contractor
1	Type of Starter		DOL/ ASD/ Soft	
2	Name of Manufacturer			
3	Rating	kW		
4	Protection required		Minimum Over current, under voltage, single phasing, Phase reversal, Electronic Timer.	

ANNEXURE 2 TO SECTION 4B

Name of Project	Bihar Urban Development Investment Program – Tranche 2 (ADB Loan: Applied for / Project No. IND-41603-023)
Name of Employer:	Bihar Urban Infrastructure Development Corporation Limited (BUIDCo)
Contract Title:	Improvement of Water Supply System in Gaya Municipal Corporation
Contract Package No:	GA/WS/01
Bidder's Name :	
Bill No. 15A : SCADA, FURNITURE AND EQUIPMENT	

Item No.	Description	Unit	Quantity	Rate To be Quoted by Bidder (INR)		Amount To be Quoted by Bidder (INR)
				Figures	Words	
15A.1	SCADA					
15A.1.1	<p>Design, development, Supplying, installing, testing & commissioning of SCADA system complete with IT hardware and software, compatible with the existing and proposed water supply system comprising the following:</p> <p>Package-1 (Existing)</p> <ol style="list-style-type: none"> 1. 37 Tube Wells 2. 17 Service Reservoirs 3. 30 DMAs <p>Package-2 (Proposed)</p> <ol style="list-style-type: none"> 4. 24 nos. Tube Wells 5. 1 Clear water Reservoir – Storage & Pumping 	1 set	1			

Item No.	Description	Unit	Quantity	Rate To be Quoted by Bidder (INR)		Amount To be Quoted by Bidder (INR)
				Figures	Words	
	<p>6. 1 GLSR</p> <p>As per section 2.6.5 of Bid Document GWSP1, Vol-1 and Section 6 of Bid Document GWSP1, Vol-II, Technical Specifications – Operations including Remote communication hardware and software for interfacing SCADA and server cum operator work station and operator Engineering station with 3 Nos. of HMIs complete with redundant system backup , industrial grade TFT monitors, key boards, operating system, power backups and furniture desks, chairs and cupboard etc.</p>					
15A.2	Supply, delivery, installation and commissioning of the followings					
15A.2.1	Server and networking	Nos.	5			
15A.2.2	Computer with power backup for 5 hour with inbuilt Window 8 operating system software	Nos	20			
15A.2.3	Bulk color printer with scanner, Xerox, for printing both sides up to A3 size, capable to print 25 pages per minutes.	Nos	5			

Item No.	Description	Unit	Quantity	Rate To be Quoted by Bidder (INR)		Amount To be Quoted by Bidder (INR)
				Figures	Words	
15A.2.4	Desktop LaserJet printer for printing up to A4 size	Nos	5			
15A.2.5	Handheld Billing printer	Nos	30			
15A.2.6	Latest Soft wares for 5 users for subscription up to one year after the end of contract period.					
15A.2.6.1	MS office	No	5			
15A.2.6.2	Handheld unit with mobile software for filling	No	3			
15A.2.6.3	Hand billing software	No	5			
15A.2.6.4	MS project	No	1			
15A.2.6.5	AutoCAD	No	2			

Item No.	Description	Unit	Quantity	Rate To be Quoted by Bidder (INR)		Amount To be Quoted by Bidder (INR)
				Figures	Words	
15A.2.6.6	WaterGEMS	No	1			
15A.2.6.7	Billing system	No	1			
15A.2.6.8	MIS and GIS based utility management software	No	1			
15A.2.7	Furniture for Consumer centers					
15A.2.7.1	Office Desks with drawers	No	40			
15A.2.7.2	Computer wheeled Chairs with arms	No	80			
15A.2.7.3	Airport Chairs	No	50			
15A.2.7.4	Sign boards	No	5			
15A.2.7.5	Pantry equipment with water cooler	No	5			

Item No.	Description	Unit	Quantity	Rate To be Quoted by Bidder (INR)		Amount To be Quoted by Bidder (INR)
				Figures	Words	
15A.2.7.6	Steel Amirah (6' height) with reputed make	No	5			
15A.2.7.7	Interior like window curtains, wall clock, decorating lights, notice board and white boards	No	5			
Subtotal for Bill No.15A		In Figures				
		In Words				

ANNEXURE 3 TO TECHNICAL SPECIFICATION SECTION 6 PART 2 VOLUME 2

1. Reinforced Cement Concrete (RCC) Pipes

1.1 SCOPE

1.1.1 This Specification covers the requirements for manufacturing, testing, supplying, jointing and, testing at work sites, of Reinforced Cement Concrete (RCC) pipes, of both pressure and non pressure varieties used for pumping mains, sewers and storm water drains.

1.2 APPLICABLE CODES

1.2.1 The manufacturing, testing, supplying, jointing and testing at work sites of RCC pipes shall comply with all currently applicable statutes, regulations, standards and Codes. In particular, the following standards, unless otherwise specified herein, shall be referred. In all cases, the latest revision of the Codes shall be referred to. If requirements of this Specification conflict with the requirements of the Codes and standards, this Specification shall govern.

1.3 Materials

- a) IS: 458 Specification for Concrete Pipes (with and Without Reinforcement).
- b) IS: 3597 Method of Tests for Concrete Pipes.
- c) IS: 5382 Specification for Rubber Sealing Rings for Gas Mains, Water Mains and Sewers.
- d) 16.1.3.1 Codes of practice
- e) IS: 456 Code of Practice for Plain and Reinforced Concrete.
- f) IS: 783 Code of Practice for Laying of Concrete Pipes.

1.4 Design

Design of RCC pipes shall be in accordance with the relevant clauses of IS: 454. The details of reinforcement shall be as per Clause 5.2 of IS: 458. The ends of pipes shall be in accordance with relevant clauses of IS: 458.

1.5 Manufacturing

1.5.1 General

1. The method of manufacture shall be such that the form and the dimensions of the finished pipes are accurate within the limits specified in relevant IS: 458. The surfaces and edges of the pipes shall be well defined and true, and their ends shall be square with the longitudinal axis. The ends of the pipes shall be further reinforced by an extra ring of reinforcement to avoid breakage during transportation.

2. The RCC pipes and collars / rubber rings shall be systematically checked for any manufacturing defects by experienced supervisors so as to maintain a high standard of quality

3. Engineer shall at all reasonable times have free access to the places where the pipes and collars / rubber rings are manufactured for the purpose of examining and testing the pipes and collars / rubber rings and of witnessing the test and manufacturing.

4. All tests specified either in this Specification or in the relevant Indian Standards shall be performed by Supplier / Contractor at his own cost and in presence of Engineer if desired. For this, sufficient notice before testing of the pipes shall be given to Engineer.

5. If the test is found unsatisfactory, Engineer may reject any or all pipes of that lot. The decision of Engineer in this matter shall be final and binding on Contractor and not subject to any arbitration or appeal.

1.5.2 Curing

Pipes manufactured in compliance with IS: 458 shall be either water cured or steam cured in accordance with the relevant requirements of IS: 458.

1.5.3 Dimensions

1. The internal diameter, wall thickness and length of barrel and collar of pipes, reinforcement (longitudinal and spiral), type of ends and minimum clear cover to reinforcement and strength test requirements shall be as per the relevant clauses / tables of IS: 458 for different class of pipes.

2. The tolerances regarding overall length, internal diameter of pipes or socket and barrel wall thickness shall be as per relevant clauses of IS: 458.

1.5.4 Workmanship and finish

1. Pipes shall be straight and free from cracks except that craze cracks may be permitted. The ends of the pipes shall be square with their longitudinal axis so that when placed in a straight line in the trench no opening between ends in contact shall exceed 3 mm in pipes upto 600 mm diameter (inclusive), and 6 mm in pipes larger than 600 mm diameter.

2. The outside and inside surfaces of the pipes shall be smooth, dense and hard, and shall not be coated with cement wash or other preparation unless otherwise agreed to between Engineer and the manufacturer or supplier.

3. The pipes shall be free from defects resulting from imperfect grading of the aggregate, mixing or moulding.

4. The pipes shall be free from local dents or bulges greater than 3.00 mm in depth and extending over a length in any direction greater than twice the thickness of barrel.

5. The deviation from straight in any pipes throughout its effective length, tested by means of a rigid straight edge parallel to the longitudinal axis of the pipe shall not exceed, for all diameters, 3 mm for every metre run.

1.6 Testing

1.6.1 All pipes for testing purposes shall be selected at random from the stock of the manufacturer and shall be such as would not otherwise be rejected under the criteria of tolerances as mentioned in IS: 458.

1.6.2 During manufacture, tests on concrete shall be carried out as per IS: 456. The manufacturer shall supply, when required to do so by Engineer the results of compressive tests of concrete cylinders or cubes made from the concrete used for the pipes. Every pressure pipe shall be tested by the manufacturer for the hydrostatic test pressure.

1.6.3 The specimen of pipes for the following tests shall be selected in accordance with **Clause 9.1** of IS: 458 and tested in accordance with the methods described in IS: 3597:

1. Hydrostatic test.
2. Three edge bearing test or sand bearing test.
3. Absorption test.
4. Bursting test.

Note: Three edge bearing strength to produce 0.25 mm crack in case of special design of pipes

shall be as follows:

300 mm Ø	1200 kg/m
350 mm Ø	3040 kg/m
400 mm Ø	3460 kg/m
450 mm Ø	4160 kg/m
500 mm Ø	4160 kg/m
600 mm Ø	4720 kg/m
700 mm Ø	5320 kg/m
800 mm Ø	6060 kg/m
900 mm Ø	6760 kg/m
1000 mm Ø	7400 kg/m
1100 mm Ø	8200 kg/m

1.7 Sampling and inspection

1.7.1 In any consignment, all the pipes of same class and size and manufactured under similar conditions of production shall be grouped together to constitute a lot. The conformity of a lot to the requirements of this Specification shall be ascertained on the basis of tests on pipes selected from it.

1.7.2 The number of pipes to be selected from the lot shall be in accordance with column 1 and 2 of Table 9 of IS: 458.

1.7.3 Pipes shall be selected at random. In order to ensure randomness, all the pipes in the lot may be arranged in a serial order and starting from any pipe, every "r th" pipe

be selected till the requisite number is obtained, “r” being the integral part of N/n where “N” is the lot size and “n” is the sample size.

1.7.4 The number of pipes to be tested for tests shall be in accordance with column of Table 9 of IS: 458.

1.7.5 A lot shall be considered as conforming to the requirements of IS: 458 if the following conditions are satisfied.

1. The number of defective pipes (those not satisfying one or more of the requirements for dimensions, finish and deviation from straight) shall not be more than the permissible number given in Column 3 of Table 9 of IS: 458.

2. All the pipes tested for various tests shall satisfy corresponding requirements of the tests.

3. In case the number of pipes not satisfying requirements of any one or more tests, one or two further sample of same size shall be selected and tested for the test or tests in which failure has occurred. All these pipes shall satisfy the corresponding requirements of the test.

1.8 Marking

1.8.1 The following information shall be clearly marked on each pipe:

1. Internal diameter of pipe.
2. Class of pipe.
3. Date of manufacture, and
4. Name of manufacturer or his registered trademark or both.

1.9 Jointing

1.9.1 Jointing of RCC pipes shall be done as per the requirements of following Specifications and as per the relevant IS. The type of joints shall be as specified in the Contract / Drawing. After jointing extraneous material if any, shall be removed from the inside of the pipe and newly made joints shall be thoroughly cured. In case, rubber sealing rings are used for jointing, these shall conform to IS: 5382.

1.9.2 Spigot and Socket Joint (Rigid)

The spigot of each pipe shall be slipped home well into the socket of the pipe previously laid and adjusted in the correct position. The opening of the joint shall be filled with stiff mixture of cement mortar in the proportion of 1:1, which shall be rammed with caulking tool.

1.9.3 Collar Joint (Rigid)

After laying the RCC pipes at proper alignment and gradient their abutting faces shall be coated with hot bitumen in liquid condition by means of a brush. The wedge-shaped groove in the end of the pipe shall then be filled with a tarred gasket in one length for each joint. The collar shall then be slipped over the end of the pipe and the next pipe

butted well against the tarred gasket by suitable appliances approved by Engineer so as to thoroughly compress the tarred gasket into the grooves, care being taken that the concentricity of the pipes and levels are not disturbed during this operation. The collar shall then be placed symmetrically over the end of the two pipes and the space between the inside of the collar and the outside of the pipe filled with a mixture of cement and sand in the proportion of 1:1, tempered with just sufficient water to have a consistency of the semi dry conditions, well packed and thoroughly rammed with caulking tools. The joints shall be finished off with a filled sloping at 45° to the side of the pipe. The finished joints shall be protected and cured thoroughly as directed by Engineer. Any plastic solution or cement mortar that may have been squeezed into the inside of the pipe shall be removed so as to leave the inside of the pipe perfectly clean.

1.9.4 Spigot and Socket Joint (Semi-flexible)

This joint is composed of specially shaped spigot and socket ends on the RCC pipes. A rubber ring, shall be lubricated and then placed on the spigot which is forced into the socket of the pipe previously laid. This compresses the rubber ring as it rolls into the annular space formed between the two surfaces of the spigot and socket, stiff mixture of cement and mortar in the proportion of 1:1, shall then be filled into the remaining annular space and rammed with a caulking tool.

1.9.5 Collar Joint (Semi-flexible)

This joint is made up of a loose collar which covers two specially shaped pipe ends. Each end shall be fitted with a rubber ring, which when compressed between the spigot and collar, seal the joint. Stiff mixture of cement mortar in the proportion of 1:1, shall then be filled into the remaining annular space and rammed with a caulking tool.

1.9.6 Spigot and Socket Joint (Flexible)

The RCC pipe with the rubber ring accurately positioned on the spigot shall be pushed well home into the socket of the previously laid pipes. The manufacturers instructions shall be used, and the manufacturers instructions shall be deemed to form a part of this Specifications. The rubber rings shall be lubricated before making the joint and the lubricant shall be soft soap water or an approved lubricant supplied by the manufacturer.

1.9.7 Flush Joint (Internal)

This joint shall be generally used for culvert pipe of 60 cm. diameter and over. The ends of the pipes are specially shaped to form a self-centering joint with an internal jointing spaces 1.3 cm wide. The finished joint is flush with both inside and outside with the pipe wall. The jointing space is filled with cement mortar in the proportion of 1:1, mixed sufficiently dry to remain in position when forced with a trowel or rammer.

1.9.8 Flush Joint (External)

This joint is suitable for pipes which are too small for jointing from inside. This joint is composed of specially shaped pipe ends. Each end shall be butted against the other

and adjusted in correct position. The jointing space shall then be filled with cement mortar in the proportion of 1:1, sufficiently dried and finished off flush. Great care shall be taken to ensure that the projecting ends are not damaged as no repairs can be readily affected from inside the pipe.

1.10 Cleaning of pipes

1.10.1 As soon as a stretch of RCC pipes has been laid complete from manhole to manhole or for a stretch as directed by Engineer, Contractor shall run through the pipes both backwards and forwards a double disc or solid or closed cylinder 75 mm less in diameter than the internal diameter of pipes. The open end of an incomplete stretch of pipe line shall be securely closed as may be directed by Engineer to prevent entry of mud or slit etc.

1.10.2 If as a result of the removal of any obstruction, Engineer considers that damages may have been caused to the pipe lines, he shall be entitled to order the stretch to be tested immediately. Should such test prove unsatisfactory Contractor shall amend the work and carry out such further tests as are required by Engineer.

1.10.3 It shall also be ascertained by Contractor that each stretch from manhole to manhole or the stretch as directed by Engineer is absolutely clear and without any obstruction by means of visual examination of the interior of the pipeline suitably enlightened by projected sunlight or otherwise.

1.11 Testing at work site

1.11.1 After laying and jointing of RCC pipes is completed the pipe line shall be tested at work site as per the following Specifications and as directed by Engineer. All equipment for testing at work site shall be supplied and erected by the Contractor and shall be rectified by him / her to the full satisfaction of Engineer. Water used for test shall be removed from pipes and not released to the excavated trenches.

1.11.2 After the joints have thoroughly set and have been checked by Engineer and before backfilling the trenches, the entire section of the sewer (or storm water drain) shall be proved by Contractor to be water tight by filling in pipes with water to the level of 1.50 m. above the top of the highest pipe in the stretch and heading the water up for the period of one hour. The apparatus used for the purpose of testing shall be approved by Engineer. Contractor if required by Engineer shall dewater the excavated pit and keep it dry during the period of testing. The loss of water over a period of 30 minutes should be measured by adding water from a measuring vessel at regular 10 minutes intervals and noting the quantity required to maintain the original water level. For the approval of this test the average quantity added should not exceed 1 litre / hour / 100 linear metres / 10 mm nominal internal diameter. Any leakage including excessive sweating which causes a drop in the test water level will be visible and the defective part of the work should be removed and made good.

1.11.3 In case of pressure pipeline the completed stretch of pipeline shall be tested for site test pressure of 0.15g/sq.cm. The site test pressure should not be less than the maximum operating pressure plus the calculated surge pressure, but in no case should it exceed the hydrostatic test pressure, as specified in IS: 458.

1.12 Measurement

1.12.1 All RCC pipes shall be measured according to the work actually done and no allowance will be made for any waste in cutting to the exact length required. The measurement for pipes shall be in running metres nearest to a cm. of length along the centre line of pipe as actually laid at work sites.

1.13 Rate

1.14.1 The rate for providing, laying and jointing of RCC pipes shall be deemed to include the cost of collars / rubber rings, jointing material, testing and the extra excavation required for ordinary bedding of pipes and also for collars and pipe sockets if any.

1.14 Notes

1.14.1 If any damage is caused to the pipeline during the execution of work or while cleaning / testing the pipeline as specified, Contractor shall be held responsible for the same and shall replace the damaged pipeline and retest the same at his own cost to the full satisfaction of Engineer.

1.14.2 Water for testing of pipeline shall be arranged by Contractor at his own cost.

2. HOUSE SERVICE CONNECTION

2.1 PROCEDURE

- 1) The house service connection shall be provided to the consumer only after the consumer gets the approval from the competent authorities for availing such connections.
- 2) Normally the size of the house connection shall be 20mm/25mm unless otherwise determined and directed/sanctioned by GMC
- 3) The connection shall be done such that the water supply shall not be disturbed on any account.
- 4) Before service connection, consumer survey has to be done by the contractor to access the required details about the consumer and their requirements
- 5) The valves shall be closed on either side of the connection point before making connection.
- 6) Connection shall be done only in the presence of the Engineer in charge or GMC personnel.
- 7) Only one connection shall be given to the one consumer/ per house number/premises.
- 8) If the consumer is having more than one house in the same premises, then separate approval is needed from GMC for the excess connections
- 9) If commercial and residential building are in the same premises, then care shall be taken before giving service connection such that the residential connection cannot/shall not be used for commercial purpose.

- 10) If it is noticed that the residential connection is used for commercial purpose, then it shall be brought to the notice of the GMC and the Engineer for disconnection.
- 11) Connection shall be done in the distribution system only and connection shall be given from the transmission main from reservoir to DMA and rising main from tube well to service reservoir.
- 12) Appropriate saddles shall be used, depending on the size and pipe materials of distribution system available in the area.
- 13) The service connection shall be taken from the top of the pipe only.
- 14) Suitable size of brass ferrules depending on the size of connection shall be installed in the service connection as per IS 2692
- 15) The brass ferrule shall be adjusted depending upon the size of connection and it shall be ensured that allowable amount of water is flowing to the consumer end.
- 16) Ferrule adjustment to regulate the supply shall be done in the presence of the Engineer.
- 17) On completion, the ferrule shall be sealed such that further adjustment can't be done by the consumer.
- 18) MDPE blue PE -80 and 16 kg class pipe with necessary MDPE specials shall be used for service connection as specified in ISO 4227
- 19) PVC ball valve of suitable size shall be fixed in the service connection pipe.
- 20) AMR type water meter, horizontal inferential multi-jet type with magnetic drive and dry dial suitable for ambient 50° C temperature duly sealed against tampering complete with couplings at both ends and conforming to class B as per IS 779/1994 (VI Revision) with ISI mark along with manufacturer's test certificate & guarantee certificate shall be supplied and installed in the service connection after satisfactory field test.
- 21) The initial meter reading shall be recorded in the presence of the consumer and shall be recorded in the consumer survey report also.
- 22) Wherever the Service connection pipe are crossing the drainage line suitable covering pipe shall be provided.
- 23) If the service connection pipe has to cross the road, then the pipe shall be laid 1 m below the ground level only.
- 24) After satisfactory completion of service connection, the earth work shall be refilled without damaging the main pipe and service connection pipe.
- 25) The road shall be rejuvenated after the service connection
- 26) The details of connection, consumer survey details etc shall be informed to GMC and Engineer in charge for claiming the regular bill.
- 27) Any damage occurred to main pipe or any other service utilities such as cable for telephone, electric cables culverts etc shall be rectified in good condition for which no additional payment shall be made.
- 28) Any leaks found after service connection in the service pipe or in the main pipe, the leakage shall be rectified at free of cost by the contractor.
- 29) Suitable meter box shall be provided for placing the AMR type water meters.
- 30) The service connection up to the Water meter point shall be responsibility of the contractor. Pipe connection in the beyond this point shall be done the consumer.

- 31) On completion of service connection, completion plan of the house service connection shall be prepared and submitted for record purpose to the Engineer in charge.
- 32) The existing service connections also shall be shifted to the new distribution system after getting prior approval from the Engineer and GMC.
- 33) The unauthorised service connections shall be informed to the GMC and the Engineer in charge and shall be removed from the old main.
- 34) Removal of unauthorised connections shall be done in the presence on the GMC personnel to avoid legal litigations.
- 35) Upon the approval of GMC, the unauthorised service connection shall also be shifted to the new distribution system.
- 36) Necessary earth work, bailing out of water, refilling of the excavated soil, bringing the road to good condition, laying and jointing of MDPE pipes, ferrule, gate valve, Water meter, saddle suitable for the size and material of the distribution system, testing of water meter, covering pipe for the culvert/drainage crossing, defects if any arising out of the new service connection shall be included in the BOQ cost. No further cost shall be paid for any item that was not mentioned for the service connection.

3. MIS and GIS based utility management software

1. Within six months from the Operation Service Commencement Date, the Contractor, in accordance to the Technical Specifications, shall develop, establish, operate and manage during the remaining Contract Term a comprehensive Management Information system (MIS) in respect of all matters including but not limited to:
 - i. the billings and collection system;
 - ii. the consumer services, including data bases relating to complaints and questions, response times and resolution;
 - iii. financial management, including accounting systems;
 - iv. performance information systems; and
 - v. asset registers from the perspective of maintaining a prudent GIS based and computerized maintenance management system (CMMS) linked to financial and inventory system.
2. The Contractor shall develop a GIS based Utility Management system for multi-users desktop application. The software shall be able to process the complete water supply system online. It should at least be able to handle and process the following information and data:
 1. Complete data of all assets of water supply system including any future additions under this or any other contracts on GIS.
 2. Complete data related to Consumers with profile, location of Consumers on the network etc. will also be put on GIS. In case GMC provides data on existing properties, the same will also be incorporated in data base.
 3. Any other water service related asset data of GMC, which it desires to be included in the GIS data base.
 4. Generate required MIS reports for management, upgrading, removal, repair, maintenance etc. of assets.
 5. Editing and updating of the asset data base.

6. Hydraulic Modeling of the complete network or part of it to help redesign the system, locate local obstructions in distribution system/ leakages/ areas prone to pollution etc.
7. Customer complaint handling. This will involve recording of complaint and tracking the same until it is resolved. It should be capable of generating online queries and reports based on complaint type, response, time, complaint status, pending complaints, reasons for delay in complaint attending etc. This shall include, but not be limited to:
 8. carrying out all customer service related to new water connections;
 9. receiving, recording and handling all customer queries and complaints, including, but not limited to, queries and complaints related to,
 - a. water bills;
 - b. malfunctioning or inaccurate meters;
 - c. meter readings;
 - d. water quality;
 - e. water pressure; and
 - f. leakage and damaged pipes;
 - g. receiving, recording and responding to all requests related to,
 - h. a change in meter location;
 - i. a change in Customer names and
 - j. cancellation by Customers.
10. Process customer satisfaction surveys;
11. Generate reports about water produced, power consumed, power parameters at each TW etc. and provide information on the performance of each pumping set.
12. Process complete data with regard to water meters, customer profile, monthly meter readings, consumer bills and all revenue related requirements. It should be capable of generating monthly water bills and handle revenue accounts and generate relevant reports.
13. Undertake inventory management to provide information of material and spare parts in stock, received and consumed during the month.
14. Undertake processing of data regarding preventive maintenance, break down maintenance or any other repair activity undertaken on electro-mechanical equipment to help in decision making for future course of action.