



**GOVERNMENT OF BIHAR**

**PUBLIC HEALTH ENGINEERING DEPARTMENT**

**MODEL ESTIMATES**

**FOR**

**CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME**

**UNDER MUKHYAMANTRI GRAMIN PEYJAL YOJNA**

**FOR**

**100, 150 AND 200 HOUSEHOLDS**

**WITH**

**DIFFERENT TYPES OF TUBEWELLS**

**JANUARY, 2017**

## INDEX

<b>Various types of Model Estimates for Construction of Rural Piped Water Supply Schemes</b>						
Sl. No.	No. of Households in the Ward	Type and size of Tubewell	Estimated Cost in Rs. Lakh	Page No.		
1	100	150mm X 90m deep Gravel packed T/W	7.313	1	to	11
2	100	125mm X 75mm dia & 90M deep T/W for alluvial soil	6.762	12	to	22
3	100	125mm X 75mm dia & 90M deep T/W for rocky strata	7.175	23	to	34
4	100	200/165 mm dia 90 M deep drilled Tubewell by DTH Rig machine	6.601	35	to	45
5	150	150mm X 90m deep Gravel packed T/W	9.164	46	to	56
6	150	125mm X 75mm dia & 125M deep T/W for alluvial soil	9.030	57	to	67
7	150	125mm X 75mm dia & 125M deep T/W for rocky strata	9.600	68	to	78
8	150	200/165 mm dia 90 M deep drilled Tubewell by DTH Rig machine	8.452	79	to	89
9	200	150mm X 90m deep Gravel packed T/W	10.433	90	to	100
10	200	150mm X 100mm dia & 125M deep T/W for alluvial soil	10.697	101	to	112
11	200	150mm X 100mm dia & 125M deep T/W for rocky strata	11.264	113	to	124
12	200	200/165 mm dia 90 M deep drilled Tubewell by DTH Rig machine	9.721	125	to	135



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 100 HOUSE HOLDS

ESTIMATED COST-- Rs. 7.313 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 100 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 100 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	513
2.	Intermediate Stage	2033	700
3.	Ultimate Stage	2048	888

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	513	36	6	42
2033	700	49	8	57
2048	888	62	10	72

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (150mmx90m deep gravel packed T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

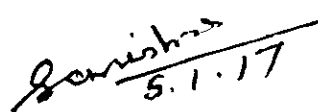
1. Provision for 150mmx90m deep gravel packed high yielding tubewell.
2. Provision for 2 HP submersible pump moter set with discharge capacity of 2 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every houschold has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 731300.00 (Seven lakhs thirty one thousand three hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost" and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
5.1.17  
(S.C. Mishra)  
Chief Engineer (Design)

4

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 100 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 150mm X 90m deep Gravel packed T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.165,744.00
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distrbution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.329,598.52
4	Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.64,403.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.151,300.00
<b>TOTAL</b>		Rs.724,085.52
Add 1% Contingency		Rs.7,240.86
<b>G. TOTAL</b>		Rs.731,326.37
<b>Say</b>		<b>Rs.731,300.00</b>

(Rs. Seven Lakh Thirty one Thousand Three Hundred ) only

note:

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 731300/- (Rupees seven Lacs thirty one thousand three hundred) only  
*[Signature]*  
 5.1.17

## (Sub Estimate - 1)

(A) Construction of 150mm X 90m deep Gravel packed T/W					
S. No.	Particulars	Quantity	Unit	Rate	Amount
1	Transportation of machine, equipments including all accessories etc.	1 No.	Each	Rs.1,010.00	Rs.1,010.00
2	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil)				
	400mm dia bore from GL to 90.0M	90 Mtr.	P/M	Rs.529.30	Rs.47,637.00
3A	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(a) 150 mm nominal size dia	59 M	P/M	Rs.615.30	Rs.36,302.70
3B	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC (UPVC) medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
	150 mm nominal size dia	30.0 M	P/M	Rs.554.30	Rs.16,629.00
4	Supplying fitting & fixing the following Fitting of approved make and specification at work site complete job.				
	(a) 150mm center guide Nos. in each T/W	9 Nos.	Each	Rs.150.00	Rs.1,350.00
	(b) 150 mm dia well plug	1 No	Each	Rs.205.10	Rs.205.10
	(b) 150 mm dia M.S. Clamp 1.6 M long (one Pair)	1 No	Each	Rs.1,031.10	Rs.1,031.10
5	Supplying 3mm to 6 mm Well washed assorted pea gravel and doing surrounding around the annular space between bore hole & 125mm pipe uniformity up to the depth 10 mtr. below G.L all work complete as per direction of E/I.	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.10,087.00
6	Carriage of Pea gravel from Dhalbhumigarh (taken av distance 400Km)	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.47,701.94
7	Supplying all materials labours and equipments to seal T/W up to the depth of 12 mtr below G.L. by Sticky clay to prevent contamination from surface from all complete job as per direction of E/I.	1 Item	Each	Rs.51.01	Rs.51.01
8	Supplying all materials labours and equipments including 150mm dia G.I. Cap /C.I. Cap over the casing of 150mm dia T/W properly all complete.	1 No.	Each	Rs.205.10	Rs.205.10
9	Carriage of necessary equipment & materials.	1 No.	Each	Rs.287.50	Rs.287.50
10	Supplying all tools equipments & labour for flushing washing and developing the T/W to give clean & clear water and all complete job as per direction of E/I.	5 H	P / H	Rs.649.40	Rs.3,247.00
TOTAL					Rs.165,744.45
Say					Rs.165,744.00

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) in cluding 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box , 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
<u>1</u>	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
<u>2</u>	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
<u>3</u>	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
<u>4</u>	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
<u>5</u>	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
<u>6</u>	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
<u>7</u>	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
<u>8</u>	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
<u>9</u>	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
		0.338 M <sup>3</sup> x	70	Kg/ M <sup>3</sup>		23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
<u>10</u>	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
<u>11</u>	Carriage of materials 5%								
								Total	Rs.12,418.89
									Rs.620.94
									<b>Rs.13,039.83</b>

Say **Rs.13,040.00**

**Sub Est. No. 3**

**WATER SUPPLY DISTRIBUTION SYSTEM**

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	75mm dia Pipe	150.00	0.30	1.10 =	49.50
	63mm dia Pipe	150.00	0.30	1.10 =	49.50
	50mm dia Pipe	300.00	0.30	1.10 =	99.00
	40mm dia Pipe	400.00	0.30	1.10 =	132.00
				330.00 M <sup>3</sup>	
	Add 5% extra for fittings =			16.50 M <sup>3</sup>	
		346.50 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.79,868.25
1B	Provision for PCC road cutting and its restoration	11.25 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.43,890.75
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	339.57 M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.25,297.97
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	75mm dia Pipe	150.00 M	P/M	Rs.239.81	Rs.35,971.50
	63mm dia Pipe	150.00 M	P/M	Rs.168.77	Rs.25,315.50
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	300.00 M	P/M	Rs.89.99	Rs.26,997.00
	40mm dia Pipe	400.00 M	P/M	Rs.59.78	Rs.23,912.00
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount
5	Constructing masonry Chamber 60x60x75 cm inside, in 18.33 brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50
	Work for additional depth				
	Brick work (1:4) in foundation				
	2 1.10 0.25 0.35 0.193				
	2 0.60 0.25 0.35 0.105				
					0.298
	Plaster (1:3)	0.298	CuM CuM	Rs.4,724.40	Rs.1,405.51
	8 1.10 0.35 3.08	3.08	SqM SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5				Rs.5,406.79
				<b>TOTAL</b>	<b>Rs.329,598.52</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 2 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-

Sl. No.	Particulars	Quantity	Unit	Rate	Amount	
1	2	3	4	5	6	
[A]	<p>Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp; commissioning as per standards specifications and direction of E/I.</p> <p>(i) 40 mm dia x 3 mtrs long medium class G.I column pipe both end threaded and one end socketed- 6(six)nos</p> <p>(ii) 1x3x1.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 40 mm dia union socket- 1(one) no.</p> <p>(iv) 50 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 40 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 40 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 40 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for 125 mm dia T/Well – 1(one) no.</p> <p>(ix) 40 mm dia x 50 mm dia reducer socket –1(one) no.</p>	1	(one) job	p/job	Rs.30,500.00	Rs.30,500.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll pannel operated on 220 V, 3 phase , 50 c/s for 2 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 95-272 V range single phase 5 KVA automatic voltage stabilizer make-Sen & Pandit/ Vertex/ISI marked If any. 1 No. (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake - 1(one) no.	1 (one) job	p/job	Rs.28,500.00	Rs.28,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.64,403.00</b>

**Sub Est. No. 5**

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs 19.97	Rs.119.82	
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70	Rs.138.70	
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50	Rs.248.94	
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth; consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50	Rs.78.85	
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10	Rs.254.10	
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00	Rs.400.00	
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00	Rs.273.00	
	Total				Rs.1,513.41	
	Say				Rs.1,513.00	

**Total Nos. of House Holds= 100 Nos. @ Rs.1,513.00 Rs.151,300.00**



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
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FOR A WARD HAVING 100 HOUSEHOLDS

ESTIMATED COST-- Rs. 6.762 Lac

JANUARY, 2017

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MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

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**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

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**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

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		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	513	36	6	42
2033	700	49	8	57
2048	888	62	10	72

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (125mmx75mmx90m deep T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

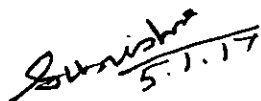
1. Provision for 125mmx75mmx90m high yielding tubewell.
2. Provision for 2 HP submersible pump moter set with discharge capacity of 2 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 676200.00 (Six lakhs seventy six thousand two hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
5.1.17  
(S.C. Mishra)  
Chief Engineer (Design)

15

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**

**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 100 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 125mm X75mmx 90m deep T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.111,137.68
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.329,598.52
4	Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.64,403.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.151,300.00
<b>TOTAL</b>		Rs.669,479.20
Add 1% Contingency		Rs.6,694.79
<b>G. TOTAL</b>		Rs.676,173.99
<b>Say</b>		<b>Rs.676,200.00</b>

(Rs. Six Lakh Seventy six Thousand Two Hundred ) only

note:

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 6.762 Lacs  
(Rupees six lac seventy six thousand two hundred) only  
S. Mishra  
5.1.17.

## CONSTRUCTION OF 125MM X 75MM DIA &amp; 90M DEEP TUBE WELL

S.No.	Description	Qty.	Unit	Rate	Amount	
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil)					
24.1.1.1	(a) 300mm dia bore from G.L. to 90.0M	90.0 M	P/M	Rs.378.00	Rs.34,020.00	
2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings					
	(b) 125 mm nominal size dia	30.0 M	P/M	Rs.462.50	Rs.13,875.00	
24.3.5	(b) 75 mm nominal size dia	34.0 M	P/M	Rs.328.50	Rs.11,169.00	
24.4.5	(c) 75 mm dia U.P.V.C. strainer	21.0 M	P/M	Rs.420.30	Rs.8,826.30	
3	Providing all materials, tools & labours and fixing the following fittings etc. all complete as per specification & direction of E/I.					
	(a) 125 mm dia P.V.C. well cap	1 No.	Each	Rs.166.60	Rs.166.60	
	(b) 125 mm dia center guide	4 Nos.	Each	Rs.100.00	Rs.400.00	
	(c) 75 mm dia center guide	6 Nos.	Each	Rs.75.00	Rs.450.00	
	(d) 75 mm dia P.V.C. pipe shoe plug	1 No.	Each	Rs.185.00	Rs.185.00	
	(e)125mm x 75 mm dia P.V.C. Reducer	1 No.	Each	Rs.475.00	Rs.475.00	
	(d)125mm dia M.S.Clamp	1 No.	Each	Rs.974.60	Rs.974.60	
4a	Providing all materials, labours, & equipments for fixing tubewell with peagravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tubewell etc. all complete as per direction of E/I.	6.5 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.5,960.50	
24.6	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	6.5 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.28,187.48	
5	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water sampl & getting tested in approved laboratory, disinfection of tubewell, all complete,including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	3 Hrs.	Each	Rs.649.40	Rs.1,948.20	
24.12	6	Supplying all materials and labours for arrangement for additional water required during the drilling period for 40 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I..	1 No.	Each	Rs.4,500.00	Rs.4,500.00
<b>TOTAL</b>					<b>Rs.111,137.68</b>	

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) in cluding 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box , 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
<u>1</u>	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
<u>2</u>	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
<u>3</u>	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
<u>4</u>	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
<u>5</u>	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
<u>6</u>	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
<u>7</u>	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
<u>8</u>	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
<u>9</u>	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/ M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
<u>10</u>	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
<u>11</u>	Carriage of materials 5%								
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>

Say Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount	
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.					
	75mm dia Pipe	150.00	0.30	1.10 =	49.50	
	63mm dia Pipe	150.00	0.30	1.10 =	49.50	
	50mm dia Pipe	300.00	0.30	1.10 =	99.00	
	40mm dia Pipe	400.00	0.30	1.10 =	132.00	
		330.00	M <sup>3</sup>			
	Add 5% extra for fittings =	16.50	M <sup>3</sup>			
		346.50	M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.79,868.25
1B	Provision for PCC road cutting and its restoration	11.25	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.43,890.75
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	339.57	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.25,297.97
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of, all taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.					
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)					
	75mm dia Pipe	150.00	M	P/M	Rs.239.81	Rs.35,971.50
	63mm dia Pipe	150.00	M	P/M	Rs.168.77	Rs.25,315.50
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)					
	50mm dia Pipe	300.00	M	P/M	Rs.89.99	Rs.26,997.00
	40mm dia Pipe	400.00	M	P/M	Rs.59.78	Rs.23,912.00
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).					
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20	
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20	
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80	
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70	

S.N.	Particulars	Quantity	Unit	Rate	Amount
5 18.33	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50
	Work for additional depth				
	Brick work (1:4) in foundation				
	2 1.10 0.25 0.35 0.193				
	2 0.60 0.25 0.35 0.105				
		0.298	CuM CuM	Rs.4,724.40	Rs.1,405.51
	Plaster (1:3)				
	8 1.10 0.35 3.08	3.08	SqM SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5				Rs.5,406.79
				<b>TOTAL</b>	<b>Rs.329,598.52</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 2 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-

Sl. No.	Particulars	Quantity	Unit	Rate	Amount	
1	2	3	4	5	6	
[A]	<p>Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp; commissioning as per standards specifications and direction of E/I.</p> <p>(i) 40 mm dia x 3 mtrs long medium class G.I column pipe both end threaded and one end socketed- 6(six)nos</p> <p>(ii) 1x3x1.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 40 mm dia union socket- 1(one) no.</p> <p>(iv) 50 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 40 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 40 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 40 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for 125 mm dia T/Well – 1(one) no.</p> <p>(ix) 40 mm dia x 50 mm dia reducer socket –1(one) no.</p>	1	(one) job	p/job	Rs.30,500.00	Rs.30,500.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll panel operated on 220 V, 3 phase , 50 c/s for 2 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 95-272 V range single phase 5 KVA automatic voltage stabilizer make-Sen & Pandit/ Vertex/ISI marked If any. 1 No. (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.28,500.00	Rs 28,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.64,403.00</b>

## Sub Est. No. 5

Estimate for the work - House service connection					
SUB-ESTIMATE					
S.No.	Description	Qty	Unit	Rate	Amount
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.				
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97	Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineecr in Charge. Internal work - Exposed on wall				
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70	Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil				
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50	Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50	Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:				
18.20.1	15mm nominal bore	1	Each	Rs.254.10	Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00	Rs.400.00
5	Providing and fixing brass bib cock of approved quality :				
18.15.1	15mm nominal bore	1	Each	Rs.273.00	Rs.273.00
	Total				Rs.1,513.41
	Say				Rs.1,513.00

Total Nos. of House Holds=

100 Nos. @

Rs.1,513.00 Rs.151,300.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*

CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME

FOR A WARD HAVING 100 HOUSE HOLD S

ESTIMATED COST-- Rs. 7.175 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 100 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 100 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	513
2.	Intermediate Stage	2033	700
3.	Ultimate Stage	2048	888

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demad in KLD
2018	513	36	6	42
2033	700	49	8	57
2048	888	62	10	72

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (125mmx75mmx90m deep T/Well for rocky strata)	:- 30 years
Electric motor & pumps	:- 15 years
Distribution network	:- 30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

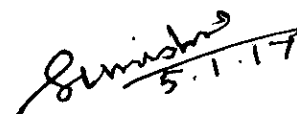
1. Provision for 125mmx75mmx90m deep T/Well for rocky strata.
2. Provision for 2 HP submersible pump moter set with discharge capacity of 2 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 717500.00 (Seven lakhs seventeen thousand five hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost" and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
5.1.17

(S.C. Mishra)  
Chief Engineer ( Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 100 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 125mm X75mmx 90m deep T/W for rocky strata etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.152,096.68
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethyene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.329,598.52
4	Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.64,403.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.151,300.00
<b>TOTAL</b>		Rs.710,438.20
Add 1% Contingency		Rs.7,104.38
<b>G. TOTAL</b>		Rs.717,542.58
<b>Say</b>		<b>Rs.717,500.00</b>

(Rs. Seven Lakh Seventeen Thousand Five Hundred) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs.717500/-  
 (Rupees seven lakh seventeen thousand five hundred) only  
 Submitted  
 5.1.17

**Sub Est. No. 1**  
**CONSTRUCTION OF 125MM X 75MM DIA & 90M DEEP TUBE WELL**  
**(For Rocky strata including Boulders)**

S.No.	Description	Qty.	Unit	Rate	Amount
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (Rocky strata including Boulders)				
24.1.1.1	(a) 300mm dia bore from G.L. to 90.0M	90.0 M	P/M	Rs.833.10	Rs.74,979.00
2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(b) 125 mm nominal size dia	30.0 M	P/M	Rs.462.50	Rs.13,875.00
24.3.5	(b) 75 mm nominal size dia	34.0 M	P/M	Rs.328.50	Rs.11,169.00
24.4.5	(c) 75 mm dia U.P.V.C. strainer	21.0 M	P/M	Rs.420.30	Rs.8,826.30
3	Providing all materials, tools & labours and fixing the following fittings etc. all complete as per specification & direction of E/I.				
	(a) 125 mm dia P.V.C. well cap	1 No.	Each	Rs.166.60	Rs.166.60
	(b) 125 mm dia center guide	4 Nos.	Each	Rs.100.00	Rs.400.00
	(c) 75 mm dia center guide	6 Nos.	Each	Rs.75.00	Rs.450.00
	(d) 75 mm dia P.V.C. pipe shoe plug	1 No.	Each	Rs.185.00	Rs.185.00
	(e)125mm x 75 mm dia P.V.C. Reducer	1 No.	Each	Rs.475.00	Rs.475.00
	(d)125 mm dia M.S.Clamp	1 No.	Each	Rs.974.60	Rs.974.60
4a 24.6	Providing all materials, labours, & equipments for fixing tubewell with peagravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tubewell etc. all complete as per direction of E/I.	6.5 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.5,960.50
4b	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	6.5 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.28,187.48

S.No.	Description	Qty.	Unit	Rate	Amount
5 24.12	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method. measuring static level & draw down etc. by step draw down method, collecting water sample & getting tested in approved laboratory, disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	3 Hrs.	Each	Rs.649.40	Rs.1,948.20
6	Supplying all materials and labours for arrangement for additional water required during the drilling period for 40 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I.	1 No.	Each	Rs.4,500.00	Rs.4,500.00
<b>TOTAL</b>					<b>Rs.152,096.68</b>

(Sub Estimate - 2)  
**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) in cluding 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box , 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

SIZE 1.00 M x 1.00 M x 0.75 M deep

S.O.R. No.	Particulars	No.	L	W	H	Qty.	Unit	Rate	Amount
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
11	Carriage of materials 5%								
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>
								Say	Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount	
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.					
	75mm dia Pipe	150.00	0.30	1.10 =	49.50	
	63mm dia Pipe	150.00	0.30	1.10 =	49.50	
	50mm dia Pipe	300.00	0.30	1.10 =	99.00	
	40mm dia Pipe	400.00	0.30	1.10 =	132.00	
		330.00	M <sup>3</sup>			
	Add 5% extra for fittings =	16.50	M <sup>3</sup>			
		346.50	M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.79,868.25
1B	Provision for PCC road cutting and its restoration	11.25	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.43,890.75
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	339.57	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.25,297.97
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of, all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.					
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)					
	75mm dia Pipe	150.00	M	P/M	Rs.239.81	Rs.35,971.50
	63mm dia Pipe	150.00	M	P/M	Rs.168.77	Rs.25,315.50
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)					
	50mm dia Pipe	300.00	M	P/M	Rs.89.99	Rs.26,997.00
	40mm dia Pipe	400.00	M	P/M	Rs.59.78	Rs.23,912.00
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).					
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20	
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20	
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80	
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70	

S.N.	Particulars	Quantity	Unit	Rate	Amount						
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications, & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50						
18.33	Work for additional depth Brick work (1:4) in foundation										
		2	1.10	0.25	0.35	0.193					
		2	0.60	0.25	0.35	0.105					
						0.298	0.298 CuM	CuM	Rs.4,724.40	Rs.1,405.51	
	Plaster (1:3)										
		8	1.10		0.35	3.08	3.08 SqM	SqM	Rs.128.20	Rs.394.86	
6	Carriage 10% of item 5									Rs.5,406.79	
										<b>TOTAL</b>	<b>Rs.329,598.52</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 2 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-

Sl. No.	Particulars	Quantity	Unit	Rate	Amount	
1	2	3	4	5	6	
[A]	<p>Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp; commissioning as per standards specifications and direction of E/I.</p> <p>(i) 40 mm dia x 3 mtrs long medium class G.I column pipe both end threaded and one end socketed- 6(six)nos</p> <p>(ii) 1x3x1.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 40 mm dia union socket- 1(one) no.</p> <p>(iv) 50 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 40 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 40 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 40 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for 125 mm dia T/Well – 1(one) no.</p> <p>(ix) 40 mm dia x 50 mm dia reducer socket –1(one) no.</p>	1	(one) job	p/job	Rs.30,500.00	Rs.30,500.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll pannel operated on 220 V, 3 phase , 50 c/s for 2 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 95-272 V range single phase 5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No. (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake - 1(one) no.	1 (one) job	p/job	Rs.28,500.00	Rs.28,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>				<b>Rs.64,403.00</b>	

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nominal bore	1.0	PM	Rs.138.70		Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50		Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00
	Total					Rs.1,513.41
	Say					Rs.1,513.00

Total Nos. of House Holds=

100 Nos. @

Rs.1,513.00 Rs.151,300.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

## *MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 100 HOUSE HOLD S

ESTIMATED COST-- Rs. 6.601 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 100 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 100 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	513
2.	Intermediate Stage	2033	700
3.	Ultimate Stage	2048	888

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	513	36	6	42
2033	700	49	8	57
2048	888	62	10	72

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (200/165mmx90m Drilled T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

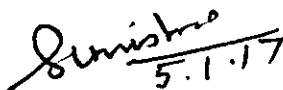
1. Provision for 200/165mmx90m deep drilled high yielding tubewell
2. Provision for 2 HP submersible pump moter set with discharge capacity of 2 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 660100.00 (Six lakhs sixty thousand one hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
5.1.17  
(S.C. Mishra)  
Chief Engineer (Design)

**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 100 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 200/165 mm dia. 90 Mtr deep Drilled High Yield Tubewell By DTH RIG Machine with Blue casing U.P.V.C. Pipe etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.95,242.91
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethyene pipe (HDPE pipe) for Distrubution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.329,598.52
4	Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.64,403.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.151,300.00
<b>TOTAL</b>		Rs.653,584.43
Add 1% Contingency		Rs.6,535.84
<b>G. TOTAL</b>		Rs.660,120.27
<b>Say</b>		<b>Rs.660,100.00</b>

(Rs. Six Lakh sixty Thousand One Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 660100/-  
(Rupees six lac sixty thousand one hundred) only  
5.1.17

## Estimate no.- 1

MODEL ESTIMATE OF CONSTRUCTION OF 200/165 MM DIA. 90 MTR DEEP DRILLED HIGH YIELD TUBEWELL BY DTH RIG MACHINE WITH BLUE CASING U.P.V.C. PIPE					
S. NO.	Particulars	Quantity	unit	Rate	Amount
1(A)	Drilling of 200mm x 165mm x 125 meter deep borewell in all kinds of soil and rock in rural area for installation of pump set with Hydraulic DTH Rig machine, all complete including supplying all materials, tools, drilling rig, Air Compressor and equipments, as well as fuel, lubricants and cost of transportation of Rig machine and other vehicles up to the site etc all complete as per specification and direction of E/I.				
5					
6	(i) Up to 50 mtrs depth below GL	50	P/M	Rs.729.52	Rs.36,476.00
7	(ii) Beyond 50 mtrs. Up to 90 Mtrs.	40	P/M	Rs.867.88	Rs.34,715.20
8	2	24	P/M	Rs.921.70	Rs.22,120.80
	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge. (200mm dia)				
9	3	1	Each	Rs.51.01	Rs.51.01
	Supplying labour, cement and calcium chloride or betonites solution and equipments for grouting to casing pipe as per specification and direction of E/I.				
10	4	2.5	P/Hr	Rs.649.40	Rs.1,623.50
	Supplying all tools labors and equipments and doing washing flushing & developing of drilled tube well to give clean and clear water ( min. 2.50 Hours)all complete as per direction of E/I.				
11	5	1	Each	Rs.256.40	Rs.256.40
	Supplying labors and equipments including 200 mm dia M.S. Cap & Fitting & Fixing over the tube well properly and taking out as per direction of E/I.				
12				<b>TOTAL</b>	<b>Rs.95,242.91</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) in cluding 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>	
<u>1</u>	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91	
S.O.R. No. 2.8										
<u>2</u>	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95	
S.O.R. No. 2.28										
<u>3</u>	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26	
S.O.R. 11.72										
<u>4</u>	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>				
S.O.O. 4.1.3										
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70	
<u>5</u>	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13	
S.O.R. No. 6.1.12/1										
<u>6</u>	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65	
S.O.R. No. 5.2.2 & 5.9.3										
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65	
<u>7</u>	C.P. (1:3) with 5% Cico & neat cement									
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>				
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>				
							5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
+13.36.1										
<u>8</u>	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15	
S.O.R. No. 13.11.2										
<u>9</u>	8mm dia T.S. Rod									
S.O.R. No. 5.22.7A										
			0.338 M <sup>3</sup> x	70	Kg/ M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00	
<u>10</u>	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00	
									Total Rs.12,418.89	
									Rs.620.94	
									<b>Rs.13,039.83</b>	

Say **Rs.13,040.00**

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	75mm dia Pipe	150.00	0.30	1.10 =	49.50
	63mm dia Pipe	150.00	0.30	1.10 =	49.50
	50mm dia Pipe	300.00	0.30	1.10 =	99.00
	40mm dia Pipe	400.00	0.30	1.10 =	132.00
	Add 5% extra for fittings =				330.00 M <sup>3</sup>
					16.50 M <sup>3</sup>
1B	Provision for PCC road cutting and its restoration	346.50 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.79,868.25
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	11.25 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.43,890.75
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of, all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.	339.57 M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.25,297.97
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	75mm dia Pipe	150.00 M	P/M	Rs.239.81	Rs.35,971.50
	63mm dia Pipe	150.00 M	P/M	Rs.168.77	Rs.25,315.50
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	300.00 M	P/M	Rs.89.99	Rs.26,997.00
	40mm dia Pipe	400.00 M	P/M	Rs.59.78	Rs.23,912.00
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount				
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50				
	Work for additional depth								
	Brick work (1:4) in foundation	2	1.10	0.25	0.35	0.193			
		2	0.60	0.25	0.35	0.105			
				0.298	0.298 CuM	CuM	Rs.4,724.40	Rs.1,405.51	
	Plaster (1:3)								
		8	1.10	0.35	3.08	3.08 SqM	SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5								Rs.5,406.79
								TOTAL	Rs.329,598.52

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 2 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-

Sl. No.	Particulars	Quantity	Unit	Rate	Amount	
1	2	3	4	5	6	
[A]	<p>Supply Installation, commissioning and testing of single phase 2 H.P. submersible pump set having discharging capacity 2 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp; commissioning as per standards specifications and direction of E/I.</p> <p>(i) 40 mm dia x 3 mtrs long medium class G.I column pipe both end threaded and one end socketed- 6(six)nos</p> <p>(ii) 1x3x1.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 40 mm dia union socket- 1(one) no.</p> <p>(iv) 50 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 40 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 40 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 40 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for 125 mm dia T/Well – 1(one) no.</p> <p>(ix) 40 mm dia x 50 mm dia reducer socket –1(one) no.</p>	1	(one) job	p/job	Rs.30,500.00	Rs.30,500.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll pannel operated on 220 V, 3 phase , 50 c/s for 2 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 95-272 V range single phase 5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No. (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.28,500.00	Rs.28,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.64,403.00</b>

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70		Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50		Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00
	Total					Rs.1,513.41
	Say					Rs.1,513.00
Total Nos. of House Holds=		100 Nos.	@	Rs.1,513.00		Rs.151,300.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 150 HOUSE HOLDS

ESTIMATED COST-- Rs. 9.164 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 150 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 150 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	769
2.	Intermediate Stage	2033	1050
3.	Ultimate Stage	2048	1331

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	769	54	8	62
2033	1050	74	11	85
2048	1331	93	15	108

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (150mmx90m deep gravel packed T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

1. Provision for 150mmx90m deep gravel packed high yielding tubewell.
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 916400.00 (Nine lakhs sixteen thousand four hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

*S.C. Mishra*  
5.1.17

(S.C. Mishra)  
Chief Engineer (Design)

49

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**

**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 150 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 150mm X 90m deep Gravel packed T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.165,744.00
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.407,993.91
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.226,950.00
<b>TOTAL</b>		Rs.907,330.91
Add 1% Contingency		Rs.9,073.31
<b>G. TOTAL</b>		Rs.916,404.22
Say		Rs.916,400.00

(Rs. Nine Lakh Sixteen Thousand Four Hundred ) only

note:

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 916400/-  
(Rupees Nine Lakh sixteen thousand four hundred) only.  
Sumishu  
5.1.17

## (Sub Estimate - 1)

(A) Construction of 150mm X 90m deep Gravel packed T/W					
S. No.	Particulars	Quantity	Unit	Rate	Amount
1	Transportation of machine, equipments including all accessories etc.	I No.	Each	Rs.1,010.00	Rs.1,010.00
2	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil) 400mm dia bore from GL to 90.0M	90 Mtr.	P/M	Rs.529.30	Rs.47,637.00
3A	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(a) 150 mm nominal size dia	59 M	P/M	Rs.615.30	Rs.36,302.70
3B	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC (UPVC) medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
	150 mm nominal size dia	30.0 M	P/M	Rs.554.30	Rs.16,629.00
4	Supplying fitting & fixing the following Fitting of approved make and specification at work site complete job.				
	(a) 150mm center guide Nos. in each T/W	9 Nos.	Each	Rs.150.00	Rs.1,350.00
	(b) 150 mm dia well plug	1 No	Each	Rs.205.10	Rs.205.10
	(b) 150 mm dia M.S. Clamp 1.6 M long (one Pair)	1 No	Each	Rs.1,031.10	Rs.1,031.10
5	Supplying 3mm to 6 mm Well washed assorted pea gravel and doing surrounding around the annular space between bore hole & 125mm pipe uniformly up to the depth 10 mtr. below G.L all work complete as per direction of E/I.	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.10,087.00
6	Carriage of Pea gravel from Dhalbhumigarh (taken av distance 400Km)	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.47,701.94
7	Supplying all materials labours and equipments to seal T/W up to the depth of 12 mtr below G.L. by Sticky clay to prevent contamination from surface from all complete job as per direction of E/I.	1 Item	Each	Rs.51.01	Rs.51.01
8	Supplying all materials labours and equipments including 150mm dia G.I. Cap /C.I. Cap over the casing of 150mm dia T/W properly all complete.	1 No.	Each	Rs.205.10	Rs.205.10
9	Carriage of necessary equipment & materials.	1 No.	Each	Rs.287.50	Rs.287.50
10	Supplying all tools equipments & labour for flushing washing and developing the T/W to give clean & clear water and all complete job as per direction of E/I.	5 H	P / H	Rs.649.40	Rs.3,247.00
<b>TOTAL</b>					<b>Rs.165,744.45</b>
<b>Say</b>					<b>Rs.165,744.00</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
<u>1</u>	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
<u>2</u>	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
<u>3</u>	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
<u>4</u>	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
<u>5</u>	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
<u>6</u>	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
<u>7</u>	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. Internal face									
No.	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
+13.36.1									
<u>8</u>	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
<u>9</u>	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70 Kg/		23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
				M3					
<u>10</u>	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>
								Say	Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	75mm dia Pipe	195.00 0.30 1.10 =			64.35
	63mm dia Pipe	195.00 0.30 1.10 =			64.35
	50mm dia Pipe	390.00 0.30 1.10 =			128.70
	40mm dia Pipe	520.00 0.30 1.10 =			171.60
					429.00 M <sup>3</sup>
	Add 5% extra for fittings =				21.45 M <sup>3</sup>
					450.45 M <sup>3</sup>
			P/M <sup>3</sup>	Rs.230.50	Rs.103,828.73
1B	Provision for PCC road cutting and its restoration	14.63 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.57,077.48
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	441.44 M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.32,887.35
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	75mm dia Pipe	195.00 M	P/M	Rs.239.81	Rs.46,762.95
	63mm dia Pipe	195.00 M	P/M	Rs.168.77	Rs.32,910.15
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	390.00 M	P/M	Rs.89.99	Rs.35,096.10
	40mm dia Pipe	520.00 M	P/M	Rs.59.78	Rs.31,085.60
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount
5	Constructing masonry Chamber 60x60x75 cm inside, in 18.33 brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50
	Work for additional depth				
	Brick work (1:4) in foundation				
	2 1.10 0.25 0.35 0.193				
	2 0.60 0.25 0.35 0.105				
				0.298	
		0.298	CuM CuM	Rs.4,724.40	Rs.1,405.51
	Plaster (1:3)				
	8 1.10 0.35 3.08	3.08	SqM SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5				Rs.5,406.79
				<b>TOTAL</b>	<b>Rs.407,993.91</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	<p>Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp; commissioning as per standards specifications and direction of F/I</p> <p>(i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos</p> <p>(ii) 1x3x2.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 50 mm dia union socket- 1(one) no.</p> <p>(iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 50 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 50 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 50 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for T/Well – 1(one) no.</p>	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

	(ix) 50 mm dia x 65 mm dia reducer socket -1(one) no.				
[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake - 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
				<b>Total Rs.</b>	<b>Rs.93,603.00</b>

## Sub-Est. No. 5

Estimate for the work - House service connection					
SUB-ESTIMATE					
S.No.	Description	Qty	Unit	Rate	Amount
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.				
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97	Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70	Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil				
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50	Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth; consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50	Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:				
18.20.1	15mm nominal bore	1	Each	Rs.254.10	Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00	Rs.400.00
5	Providing and fixing brass bib cock of approved quality :				
18.15.1	15mm nominal bore	1	Each	Rs.273.00	Rs.273.00
	Total				Rs.1,513.41
	Say				Rs.1,513.00

Total Nos. of House Holds=

150 Nos. @

Rs.1,513.00 Rs.226,950.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 150 HOUSE HOLDS

ESTIMATED COST-- Rs. 9.03 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 150 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 150 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	769
2.	Intermediate Stage	2033	1050
3.	Ultimate Stage	2048	1331

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	769	54	8	62
2033	1050	74	11	85
2048	1331	93	15	108

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (125mmx75mmx125m T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

#### 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

#### 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

#### 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

#### 3.0 DETAILS OF PROPOSAL

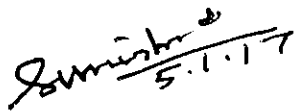
1. Provision for 125mmx75mmx125m high yielding tubewell
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

#### 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 903000.00 (Nine lakhs three thousand) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

#### 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 150 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 125 mm x75mmX 125m deep T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.152,506.32
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distrubtion network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.407,993.91
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.226,950.00
<b>TOTAL</b>		Rs.894,093.24
Add 1% Contingency		Rs.8,940.93
<b>G. TOTAL</b>		Rs.903,034.17
<b>Say</b>		<b>Rs.903,000.00</b>

(Rs. Nine Lakh Three Thousand ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 903000/- (Rupees Nine Lakh Three Thousand) only.

*Sumitran*  
5.1.17

## CONSTRUCTION OF 125MM X 75MM DIA &amp; 125M DEEP TUBE WELL

S.No.	Description	Qty.	Unit	Rate	Amount
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil)				
24.1.1.1	(a) 300mm dia bore from G.L. to 30.0M	30.0 M	P/M	Rs.378.00	Rs.11,340.00
	(b) 300mm dia bore from 30.0 m to 60.0M	30.0 M	P/M	Rs.378.00	Rs.11,340.00
	(c) 300mm dia bore from 60M to 90.0M	30.0 M	P/M	Rs.378.00	Rs.11,340.00
24.2.1.1	(d) 300mm dia bore from 90.0M to 150.0M	35.0 M	P/M	Rs.441.10	Rs.15,438.50
2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(b) 125 mm nominal size dia	30.0 M	P/M	Rs.462.50	Rs.13,875.00
24.3.5	(b) 75 mm nominal size dia	69.0 M	P/M	Rs.328.50	Rs.22,666.50
24.4.5	(c) 75 mm dia U.P.V.C. strainer	21.0 M	P/M	Rs.420.30	Rs.8,826.30
3	Providing all materials, tools & labours and fixing the following fittings etc. all complete as per specification & direction of E/I.				
	(a) 125 mm dia P.V.C. well cap	1 No.	Each	Rs.166.60	Rs.166.60
	(b) 125 mm dia center guide	4 Nos.	Each	Rs.100.00	Rs.400.00
	(c) 75 mm dia center guide	6 Nos.	Each	Rs.75.00	Rs.450.00
	(d) 75 mm dia P.V.C. pipe shoe plug	1 No.	Each	Rs.185.00	Rs.185.00
	(e)125mm x 75 mm dia P.V.C. Reducer	1 No.	Each	Rs.475.00	Rs.475.00
	(d)125mm dia M.S.Clamp	1 No.	Each	Rs.974.60	Rs.974.60
4a	Providing all materials, labours, & equipments for fixing				
24.6	tubewell with peagravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tubewell etc. all complete as per direction of E/I.	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.8,253.00
4b	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.39,028.82
5	Development of tube well in accordance with IS : 2800				
24.12	(part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water sample & getting tested in approved laboratory, disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	5 Hrs.	Each	Rs.649.40	Rs.3,247.00
6	Supplying all materials and labours for arrangement for additional water required during the drilling period for 40 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I..	1 No.	Each	Rs.4,500.00	Rs.4,500.00
<b>TOTAL</b>					<b>Rs.152,506.32</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

**SIZE**                      **1.00 M**      x      **1.00 M**      x      **0.75 M deep**

S.O.R. No.	Particulars	No.	L	W	H	Qty.	Unit	Rate	Amount
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. Internal face		2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
No. Bed surface		1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
11	Carriage of materials 5%								
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>

Say Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount	
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.					
	75mm dia Pipe	195.00	0.30	1.10 =	64.35	
	63mm dia Pipe	195.00	0.30	1.10 =	64.35	
	50mm dia Pipe	390.00	0.30	1.10 =	128.70	
	40mm dia Pipe	520.00	0.30	1.10 =	171.60	
		429.00	M <sup>3</sup>			
	Add 5% extra for fittings =	21.45	M <sup>3</sup>			
		450.45	M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.103,828.73
1B	Provision for PCC road cutting and its restoration	14.63	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.57,077.48
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	441.44	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.32,887.35
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of, all taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.					
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)					
	75mm dia Pipe	195.00	M	P/M	Rs.239.81	Rs.46,762.95
	63mm dia Pipe	195.00	M	P/M	Rs.168.77	Rs.32,910.15
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)					
	50mm dia Pipe	390.00	M	P/M	Rs.89.99	Rs.35,096.10
	40mm dia Pipe	520.00	M	P/M	Rs.59.78	Rs.31,085.60
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).					
	75mm dia Pipe	2	Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2	Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2	Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3	Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50
18.33	Work for additional depth Brick work (1:4) in foundation				
	2 1.10 0.25 0.35 0.193				
	2 0.60 0.25 0.35 0.105				
	0.298	0.298	CuM CuM	Rs.4,724.40	Rs.1,405.51
	Plaster (1:3)				
	8 1.10 0.35 3.08	3.08	SqM SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5				Rs.5,406.79
				<b>TOTAL</b>	<b>Rs.407,993.91</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	<p>Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp;</p> <p>(i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos</p> <p>(ii) 1x3x2.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 50 mm dia union socket- 1(one) no.</p> <p>(iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 50 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 50 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 50 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for T/Well – 1(one) no.</p> <p>(ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.</p>	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>				<b>Rs.93,603.00</b>	

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70		Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50		Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00
	Total					Rs.1,513.41
	Say					Rs.1,513.00

Total Nos. of House Holds=

150 Nos. @

Rs.1,513.00 Rs.226,950.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 150 HOUSE HOLDS

ESTIMATED COST-- Rs. 9.60 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 150 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 150 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	769
2.	Intermediate Stage	2033	1050
3.	Ultimate Stage	2048	1331

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demad in KLD
2018	769	54	8	62
2033	1050	74	11	85
2048	1331	93	15	108

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source 125mmx75mmx90m deep T/Well for rocky strata)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

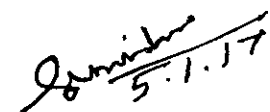
1. Provision for 125mmx75mmx90m deep T/Well for rocky strata.
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 960000.00 (Nine lakhs sixty thousand) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 150 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 125 mm x75mmX 125m deep T/W for rocky strata etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.208,868.82
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.407,993.91
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.226,950.00
<b>TOTAL</b>		Rs.950,455.74
Add 1% Contingency		Rs.9,504.56
<b>G. TOTAL</b>		Rs.959,960.29
<b>Say</b>		<b>Rs.960,000.00</b>

(Rs. Nine Lakh sixty Thousand ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 960000/- (Rupees Nine Lakh sixty thousand) only.  
 Sanishu  
 5.1.17

## Sub Est. No. 1

## CONSTRUCTION OF 125 MM X 75MM DIA &amp; 125M DEEP TUBE WELL

## (For Rocky strata including Boulders)

S.No.	Description	Qty.	Unit	Rate	Amount
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (Rocky strata including Boulders)				
24.1.1.1	(a) 300mm dia bore from G.L. to 30.0M	30.0 M	P/M	Rs.833.10	Rs.24,993.00
	(b) 300mm dia bore from 30.0 m to 60.0M	30.0 M	P/M	Rs.833.10	Rs.24,993.00
	(c) 300mm dia bore from 60M to 90.0M	30.0 M	P/M	Rs.833.10	Rs.24,993.00
24.2.1.1	(d) 300mm dia bore from 90.0M to 150.0M	35.0 M	P/M	Rs.881.20	Rs.30,842.00
2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(b) 125 mm nominal size dia	30.0 M	P/M	Rs.462.50	Rs.13,875.00
24.3.5	(b) 75 mm nominal size dia	69.0 M	P/M	Rs.328.50	Rs.22,666.50
24.4.5	(c) 75 mm dia U.P.V.C. strainer	21.0 M	P/M	Rs.420.30	Rs.8,826.30
3	Providing all materials, tools & labours and fixing the following fittings etc. all complete as per specification & direction of E/I.				
	(a) 125 mm dia P.V.C. well cap	1 No.	Each	Rs.166.60	Rs.166.60
	(b) 125 mm dia center guide	4 Nos.	Each	Rs.100.00	Rs.400.00
	(c) 75 mm dia center guide	6 Nos.	Each	Rs.75.00	Rs.450.00
	(d) 75 mm dia P.V.C. pipe shoe plug	1 No.	Each	Rs.185.00	Rs.185.00
	(e)125mm x 75 mm dia P.V.C. Reducer	1 No.	Each	Rs.475.00	Rs.475.00
24.14.1	(d)125mm dia M.S.Clamp	1 No.	Each	Rs.974.60	Rs.974.60
4a	Providing all materials, labours, & equipments for fixing				
24.6	tubewell with peagravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tubewell etc. all complete as per direction of E/I.	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.8,253.00
4b	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.39,028.82
5	Development of tube well in accordance with IS : 2800				
24.12	(part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water sample & getting tested in approved laboratory, disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	5 Hrs.	Each	Rs.649.40	Rs.3,247.00
6	Supplying all materials and labours for arrangement for additional water required during the drilling period for 40 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I..	1 No.	Each	Rs.4,500.00	Rs.4,500.00
<b>TOTAL</b>					<b>Rs.208,868.82</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

**SIZE**                      **1.00 M**        **x**        **1.00 M**        **x**        **0.75 M deep**

S.O.R. No.	Particulars	No.	L	W	H	Qty.	Unit	Rate	Amount
1 S.O.R. No. 2.8	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
2 S.O.R. No. 2.28	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
3 S.O.R. 11.72	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
4 S.O.O. 4.1.3	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5 S.O.R. No. 6.1.12/1	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
6 S.O.R. No. 5.2.2 & 5.9.3	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7 S.O.R. No. +13.36.1	C.P. (1:3) with 5% Cico & neat cement								
	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8 S.O.R. No. 13.11.2	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
9 S.O.R. No. 5.22.7A	8mm dia T.S. Rod								
			0.338 M <sup>3</sup> x	70 Kg/M <sup>3</sup>		23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
11	Carriage of materials 5%							Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>

**Say Rs.13,040.00**

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	75mm dia Pipe	195.00	0.30	1.10 =	64.35
	63mm dia Pipe	195.00	0.30	1.10 =	64.35
	50mm dia Pipe	390.00	0.30	1.10 =	128.70
	40mm dia Pipe	520.00	0.30	1.10 =	171.60
					429.00 M <sup>3</sup>
	Add 5% extra for fittings =				21.45 M <sup>3</sup>
					450.45 M <sup>3</sup>
1B	Provision for PCC road cutting and its restoration	14.63 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.103,828.73
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	441.44 M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.32,887.35
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	75mm dia Pipe	195.00 M	P/M	Rs.239.81	Rs.46,762.95
	63mm dia Pipe	195.00 M	P/M	Rs.168.77	Rs.32,910.15
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	390.00 M	P/M	Rs.89.99	Rs.35,096.10
	40mm dia Pipe	520.00 M	P/M	Rs.59.78	Rs.31,085.60
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount					
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve,with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10. graded stone aggregate 40 mm nominalsize) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9 Nos.	Each	Rs.5,807.50	Rs.52,267.50					
18.33	Work for additional depth Brick work (1:4) in foundation	2	1.10	0.25	0.35	0.193				
		2	0.60	0.25	0.35	0.105				
	Plaster (1:3)					0.298	0.298 CuM	CuM	Rs.4,724.40	Rs.1,405.51
		8	1.10		0.35	3.08	3.08 SqM	SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5									Rs.5,406.79
	<b>TOTAL</b>									<b>Rs.407,993.91</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	<p>Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp;</p> <p>(i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos</p> <p>(ii) 1x3x2.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 50 mm dia union socket- 1(one) no.</p> <p>(iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 50 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 50 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 50 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for T/Well – 1(one) no.</p> <p>(ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.</p>	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control panel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.93,603.00</b>

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70		Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50		Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00
	Total					Rs.1,513.41
	Say					Rs.1,513.00

Total Nos. of House Holds=

150 Nos. @

Rs.1,513.00 Rs.226,950.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

## *MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 150 HOUSE HOLDS

ESTIMATED COST-- Rs. 8.452 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 150 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 150 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	769
2.	Intermediate Stage	2033	1050
3.	Ultimate Stage	2048	1331

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	769	54	8	62
2033	1050	74	11	85
2048	1331	93	15	108

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (200/165mmx90m drilled T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

1. Provision for 200/165mmx90m deep drilled high yielding tubewell
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 845200.00 (Eight lakhs forty five thousand two hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost" and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

*S.C. Mishra*  
5.1.17

(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**

82

**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 150 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 200/165 mm dia. 90 Mtr deep Drilled High Yield Tubewell By DTH RIG Machine with Blue casing U.P.V.C. Pipe etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.95,242.91
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethyene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.407,993.91
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.226,950.00
<b>TOTAL</b>		Rs.836,829.82
Add 1% Contingency		Rs.8,368.30
<b>G. TOTAL</b>		Rs.845,198.12
<b>Say</b>		<b>Rs.845,200.00</b>

(Rs. Eight Lakh Forty five Thousand Two Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alla includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 845200/-  
(Rupees eight lakh forty five thousand two hundred) only.  
*Sunish*  
5.1.17

## Estimate no.- 1

2	<b>MODEL ESTIMATE OF CONSTRUCTION OF 200/165 MM DIA. 90 MTR DEEP DRILLED HIGH YIELD TUBEWELL BY DTH RIG MACHINE WITH BLUE CASING U.P.V.C. PIPE</b>					
3						
4	<b>S. NO.</b>	<b>Particulars</b>	<b>Quantity</b>	<b>unit</b>	<b>Rate</b>	<b>Amount</b>
5	1(A)	Drilling of 200mm x 165mm x 125 meter deep borewell in all kinds of soll and rock in rural area for installation of pump set with Hydaraulic DTH Rig machine, all complete including supplying all materials, tools, drilling rig, Air Compressor and equipments, as well as fuel, lubricants and cost of transportation of Rig machine and other vehicles up to the site etc all complete as per specification and direction of E/l.				
6		(i) Up to 50 mtrs depth below GL	50	P/M	Rs.729.52	Rs.36,476.00
7		(ii) Beyond 50 mtrs. Up to 90 Mtrs.	40	P/M	Rs.867.88	Rs.34,715.20
8	2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge. (200mm dia)	24	P/M	Rs.921.70	Rs.22,120.80
9	3	Supplying labour, cement and calclum chloride or betonites solution and equipments for grouting to casing pipe as per specification and direction of E/l.	1	Each	Rs.51.01	Rs.51.01
10	4	Supplying all tools labors and equipments and doing washing flushing & developing of drilled tube well to give clean and clear water ( min. 2.50 Hours)all complete as per direction of E/l.	2.5	P/Hr	Rs.649.40	Rs.1,623.50
11	5	Supplying labors and equipments including 200 mm dia M.S. Cap & Fitting & Fixing over the tube well properly and taking out as per direction of E/l.	1	Each	Rs.256.40	Rs.256.40
12	<b>TOTAL</b>					<b>Rs.95,242.91</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
<u>1</u>	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
<u>2</u>	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
<u>3</u>	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
<u>4</u>	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
<u>5</u>	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
<u>6</u>	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
<u>7</u>	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. Internal face									
No.	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
+13.36.1									
<u>8</u>	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
<u>9</u>	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
<u>10</u>	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>

Say Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	75mm dia Pipe	195.00	0.30	1.10 =	64.35
	63mm dia Pipe	195.00	0.30	1.10 =	64.35
	50mm dia Pipe	390.00	0.30	1.10 =	128.70
	40mm dia Pipe	520.00	0.30	1.10 =	171.60
				429.00 M <sup>3</sup>	
	Add 5% extra for fittings =			21.45 M <sup>3</sup>	
				450.45 M <sup>3</sup>	P/M <sup>3</sup> Rs.230.50 Rs.103,828.73
1B	Provision for PCC road cutting and its restoration	14.63	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40 Rs.57,077.48
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	441.44	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50 Rs.32,887.35
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	75mm dia Pipe	195.00	M	P/M	Rs.239.81 Rs.46,762.95
	63mm dia Pipe	195.00	M	P/M	Rs.168.77 Rs.32,910.15
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	390.00	M	P/M	Rs.89.99 Rs.35,096.10
	40mm dia Pipe	520.00	M	P/M	Rs.59.78 Rs.31,085.60
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	75mm dia Pipe	2	Nos.	Each	Rs.1,351.60 Rs.2,703.20
	63mm dia Pipe	2	Nos.	Each	Rs.1,351.60 Rs.2,703.20
	50mm dia Pipe	2	Nos.	Each	Rs.811.40 Rs.1,622.80
	40mm dia Pipe	3	Nos.	Each	Rs.613.90 Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount							
5 18.33	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	9	Nos. Each	Rs.5,807.50	Rs.52,267.50							
	Work for additional depth											
	Brick work (1:4) in foundation	2	1.10	0.25	0.35	0.193						
		2	0.60	0.25	0.35	0.105						
						0.298	0.298	CuM	CuM	Rs.4,724.40	Rs.1,405.51	
	Plaster (1:3)	8	1.10		0.35	3.08	3.08	SqM	SqM	Rs.128.20	Rs.394.86	
6	Carriage 10% of item 5										Rs.5,406.79	
											<b>TOTAL</b>	<b>Rs.407,993.91</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	<p>Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories &amp; fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing &amp;</p> <p>(i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos</p> <p>(ii) 1x3x2.5 mm<sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs.</p> <p>(iii) 50 mm dia union socket- 1(one) no.</p> <p>(iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no.</p> <p>(v) 50 mm dia G.I Elbow—1(One) no.</p> <p>(vi) 50 mm dia M.S. clamps—2(Two) Pairs.</p> <p>(vii) 50 mmx 250 mm long G.I nipple- 1(One) no.</p> <p>(viii) Tube well cap for T/Well – 1(one) no.</p> <p>(ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.</p>	1. (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.93,603.00</b>

## Sub Est. No. 5

## Estimate for the work - House service connection

SUB-ESTIMATE									
S.No.	Description	Qty	Unit	Rate	Amount				
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.complete.								
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82			
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall								
18.7.1	15 mm nominal bore	1.0	PM	Rs.138.70		Rs.138.70			
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil								
2.8.1		6.00	0.30	0.60	1.08	1.08	CuM	Rs.230.50	Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85			
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:								
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10			
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00			
5	Providing and fixing brass bib cock of approved quality :								
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00			
	Total					Rs.1,513.41			
	Say					Rs.1,513.00			
	Total Nos. of House Holds=	150 Nos.	@	Rs.1,513.00		Rs.226.950.00			



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 200 HOUSE HOLDS

ESTIMATED COST-- Rs. 10.433 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 200 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 200 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	1025
2.	Intermediate Stage	2033	1400
3.	Ultimate Stage	2048	1775

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demad in KLD
2018	1025	72	11	83
2033	1400	98	15	113
2048	1775	124	20	144

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (150mmx90m deep gravel packed T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

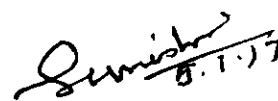
1. Provision for 150mmx90m deep gravel packed high yielding tubewell.
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3.94 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 1043300.00 (Ten lakhs forty three thousand three hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.



(S.C. Mishra)  
Chief Engineer (Design)

93

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 200 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 150mm X 90m deep Gravel packed T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.165,744.00
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.457,981.30
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.302,600.00
<b>TOTAL</b>		Rs.1,032,968.30
Add 1% Contingency		Rs.10,329.68
<b>G. TOTAL</b>		Rs.1,043,297.99
<b>Say</b>		<b>Rs.1,043,300.00</b>

(Rs. Ten Lakh Forty three Thousand Three Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 1043300/-  
 (Rupees ten lakh forty three thousand three hundred) only.  
*S. J. 17*

## (Sub Estimate - 1)

(A) Construction of 150mm X 90m deep Gravel packed T/W					
S. No.	Particulars	Quantity	Unit	Rate	Amount
1	Transportation of machine, equipments including all accessories etc.	1 No.	Each	Rs.1,010.00	Rs.1,010.00
2	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil)				
	400mm dia bore from GL to 90.0M	90 Mtr.	P/M	Rs.529.30	Rs.47,637.00
3A	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
	(a) 150 mm nominal size dia	59 M	P/M	Rs.615.30	Rs.36,302.70
3B	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC (UPVC) medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
	150 mm nominal size dia	30.0 M	P/M	Rs.554.30	Rs.16,629.00
4	Supplying fitting & fixing the following Fitting of approved make and specification at work site complete job.				
	(a) 150mm center guide Nos. in each T/W	9 Nos.	Each	Rs.150.00	Rs.1,350.00
	(b) 150 mm dia well plug	1 No	Each	Rs.205.10	Rs.205.10
	(b) 150 mm dia M.S. Clamp 1.6 M long (one Pair)	1 No	Each	Rs.1,031.10	Rs.1,031.10
5	Supplying 3mm to 6 mm Well washed assorted pea gravel and doing surrounding around the annular space between bore hole & 125mm pipe uniformity up to the depth 10 mtr. below G.L all work complete as per direction of E/I.	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.10,087.00
6	Carriage of Pea gravel from Dhalbhumigarh (taken av distance 400Km)	11 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.47,701.94
7	Supplying all materials laobours and equipments to seal T/W up to the depth of 12 mtr below G.L. by Sticky clay to prevent contamination from surface from all complete job as per direction of E/I.	1 Item	Each	Rs.51.01	Rs.51.01
8	Supplying all materials laobours and equipments including 150mm dia G.I. Cap /C.I. Cap over the casing of 150mm dia T/W properly all complete.	1 No.	Each	Rs.205.10	Rs.205.10
9	Carriage of necessary equipment & materials.	1 No.	Each	Rs.287.50	Rs.287.50
10	Supplying all tools equipments & labour for flushing washing and developing the T/W to give clean & clear water and all complete job as per direction of E/I.	5 H	P / H	Rs.649.40	Rs.3,247.00
TOTAL					Rs.165,744.45
Say					Rs.165,744.00

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
11	Carriage of materials 5%								
								Total	Rs.12,418.89
									Rs.620.94
									<u>Rs.13,039.83</u>

Say **Rs.13,040.00**

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	90mm dia Pipe	70.00	0.30	1.10 =	23.10
	75mm dia Pipe	140.00	0.30	1.10 =	46.20
	63mm dia Pipe	210.00	0.30	1.10 =	69.30
	50mm dia Pipe	420.00	0.30	1.10 =	138.60
	40mm dia Pipe	560.00	0.30	1.10 =	184.80
					462.00 M <sup>3</sup>
	Add 5% extra for fittings =				23.10 M <sup>3</sup>
		485.10 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.111,815.55
1B	Provision for PCC road cutting and its restoration	15.75 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40	Rs.61,447.05
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	475.40 M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.35,417.15
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	90mm dia Pipe	70.00 M	P/M	Rs.340.84	Rs.23,858.80
	75mm dia Pipe	140.00 M	P/M	Rs.239.81	Rs.33,573.40
	63mm dia Pipe	210.00 M	P/M	Rs.168.77	Rs.35,441.70
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	420.00 M	P/M	Rs.89.99	Rs.37,795.80
	40mm dia Pipe	560.00 M	P/M	Rs.59.78	Rs.33,476.80
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	90mm dia Pipe	2 Nos.	Each	Rs.2,016.50	Rs.4,033.00
	75mm dia Pipe	2, Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount				
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	11 Nos.	Each	Rs.5,807.50	Rs.63,882.50				
	Work for additional depth								
	Brick work (1:4) in foundation	2	1.10	0.25	0.35	0.193			
		2	0.60	0.25	0.35	0.105			
				0.298	0.298 CuM	CuM	Rs.4,724.40	Rs.1,405.51	
	Plaster (1:3)	8	1.10	0.35	3.08	3.08 SqM	SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5								Rs.6,568.29
								<b>TOTAL</b>	<b>Rs.457,981.30</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & (i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos (ii) 1x3x2.5 mm <sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs. (iii) 50 mm dia union socket- 1(one) no. (iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no. (v) 50 mm dia G.I Elbow—1(One) no. (vi) 50 mm dia M.S. clamps—2(Two) Pairs. (vii) 50 mmx 250 mm long G.I nipple- 1(One) no. (viii) Tube well cap for T/Well – 1(one) no. (ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter controll pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>				<b>Rs.93,603.00</b>	

## Sub Est. No. 5

Estimate for the work - House service connection					
SUB-ESTIMATE					
S.No.	Description	Qty	Unit	Rate	Amount
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.				
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97	Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70	Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil				
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50	Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50	Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:				
18.20.1	15mm nominal bore	1	Each	Rs.254.10	Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00	Rs.400.00
5	Providing and fixing brass bib cock of approved quality :				
18.15.1	15mm nominal bore	1	Each	Rs.273.00	Rs.273.00
	Total				Rs.1,513.41
	Say				Rs.1,513.00

Total Nos. of House Holds=

200 Nos. @

Rs.1,513.00 Rs.302,600.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

FOR  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 200 HOUSE HOLDS

ESTIMATED COST-- Rs. 10.697 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 200 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 200 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	1025
2.	Intermediate Stage	2033	1400
3.	Ultimate Stage	2048	1775

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	1025	72	11	83
2033	1400	98	15	113
2048	1775	124	20	144

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (150mmx100mmx125m T/Well) :-	30 years
Electric motor & pumps :-	15 years
Distribution network :-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

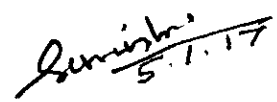
1. Provision for (150mmx100mmx125m T/Well) deep high yielding tubewell
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3.94 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 1069700.00 (Ten lakhs sixty nine thousand seven hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost " and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 200 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 150mm x100mmx125m deep T/W etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.191,907.72
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.457,981.30
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.302,600.00
<b>TOTAL</b>		Rs.1,059,132.03
Add 1% Contingency		Rs.10,591.32
<b>G. TOTAL</b>		Rs.1,069,723.35
<b>Say</b>		<b>Rs.1,069,700.00</b>

(Rs. Ten Lakh Sixty nine Thousand Seven Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs.1069700/-  
(Rupees ten lakh sixty nine thousand seven hundred) only  
*[Signature]*  
5.1.17

## CONSTRUCTION OF 150MM X 100MM DIA &amp; 125M DEEP TUBE WELL

S.No.	Description	Qty.	Unit	Rate	Amount
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (All types of soil)				
24.1.1.2	(a) 350mm dia bore from G.L. to 30.0M	30.0 M	P/M	Rs.413.50	Rs.12,405.00
24.1.1.1	(b) 300mm dia bore from 30.0 m to 60.0M	30.0 M	P/M	Rs.378.00	Rs.11,340.00
	(c) 300mm dia bore from 60M to 90.0M	30.0 M	P/M	Rs.378.00	Rs.11,340.00
24.2.1	(d) 300mm dia bore from 90.0M to 150.0M	35.0 M	P/M	Rs.441.10	Rs.15,438.50
2A	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
24.3.2	(a) 150 mm nominal size dia	30.0 M	P/M	Rs.615.30	Rs.18,459.00
24.3.1	(b) 100 mm nominal size dia	60.0 M	P/M	Rs.444.20	Rs.26,652.00
2B	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC (UPVC) medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
24.4.1	100 mm nominal size dia	30.0 M	P/M	Rs.468.80	Rs.14,064.00
3	Supplying the following fittings & fixing the same in position as per approved lowering assembly and strata chart including providing all equipments and welding the same on process of lowering the assay etc. all complete as per S/D of E/I.				
24.13.2	(a) 150 mm dia well cap	1 No.	Each	Rs.205.10	Rs.205.10
24.14.2	(b) 150 mm dia M.S. Clamp 1.6 M long (one Pair)	1 No.	Each	Rs.1,031.10	Rs.1,031.10
	(c) 150 mm dia center guide	4 Nos.	Each	Rs.150.00	Rs.600.00
	(d) 100 mm dia center guide	6 Nos.	Each	Rs.100.00	Rs.600.00
	(e) 150 mm x 100 mm dia 6mm wall thickness MS reducer	1 No.	Each	Rs.500.00	Rs.500.00
24.15.1	(f) 100mm dia & 6mm thick M.S. well shoe plug	1 No.	Each	Rs.205.60	Rs.205.60
4a	Providing all materials, labours, & equipments for fixing tube				
24.6	well with pea gravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tube well etc. all complete as per direction of E/I.	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.8,253.00
4b	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.39,028.82

S.No.	Description	Qty.	Unit	Rate	Amount
5 24.12	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water sample & getting tested in approved laboratory, disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	24 Hrs.	Each	Rs.649.40	Rs.15,585.60
6	Transportation of drilling plants, developing equipments & all other required tools and M/c by and suitable mechanical means including all cost of loading, unloading, placing at work site and back after completion of work as per S/D of E/I	1 No.	Each	Rs.9,200.00	Rs.9,200.00
7	Supplying all materials and labours for arrangement for additional water required during the drilling period for 70 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I.	1 No.	Each	Rs.7,000.00	Rs.7,000.00
	<b>TOTAL</b>				<u>Rs.191,907.72</u>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

**SIZE**                      **1.00 M**        x        **1.00 M**        x        **0.75 M deep**

<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
								Total	Rs.12,418.89
11	Carriage of materials 5%								Rs.620.94
									<u>Rs.13,039.83</u>

Say **Rs.13,040.00**

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	90mm dia Pipe	70.00	0.30	1.10 =	23.10
	75mm dia Pipe	140.00	0.30	1.10 =	46.20
	63mm dia Pipe	210.00	0.30	1.10 =	69.30
	50mm dia Pipe	420.00	0.30	1.10 =	138.60
	40mm dia Pipe	560.00	0.30	1.10 =	184.80
					462.00 M <sup>3</sup>
	Add 5% extra for fittings =				23.10 M <sup>3</sup>
					485.10 M <sup>3</sup>
				P/M <sup>3</sup>	Rs.230.50
					Rs.111,815.55
1B	Provision for PCC road cutting and its restoration	15.75	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40
					Rs.61,447.05
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	475.40	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50
					Rs.35,417.15
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	90mm dia Pipe	70.00	M	P/M	Rs.340.84
					Rs.23,858.80
	75mm dia Pipe	140.00	M	P/M	Rs.239.81
					Rs.33,573.40
	63mm dia Pipe	210.00	M	P/M	Rs.168.77
					Rs.35,441.70
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	420.00	M	P/M	Rs.89.99
					Rs.37,795.80
	40mm dia Pipe	560.00	M	P/M	Rs.59.78
					Rs.33,476.80
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	90mm dia Pipe	2	Nos.	Each	Rs.2,016.50
					Rs.4,033.00
	75mm dia Pipe	2	Nos.	Each	Rs.1,351.60
					Rs.2,703.20
	63mm dia Pipe	2	Nos.	Each	Rs.1,351.60
					Rs.2,703.20
	50mm dia Pipe	2	Nos.	Each	Rs.811.40
					Rs.1,622.80
	40mm dia Pipe	3	Nos.	Each	Rs.613.90
					Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount				
5	Constructing masonry Chamber 60x60x75 cm inside, in								
18.33	brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	11 Nos.	Each	Rs.5,807.50	Rs.63,882.50				
	Work for additional depth								
	Brick work (1:4) in foundation								
		2	1.10	0.25	0.35	0.193			
		2	0.60	0.25	0.35	0.105			
				0.298	0.298 CuM	CuM	Rs.4,724.40	Rs.1,405.51	
	Plaster (1:3)								
		8	1.10	0.35	3.08	3.08 SqM	SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5								Rs.6,568.29
									<b>TOTAL</b>
									<b>Rs.457,981.30</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & (i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos (ii) 1x3x2.5 mm <sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs. (iii) 50 mm dia union socket- 1(one) no. (iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no. (v) 50 mm dia G.I Elbow—1(One) no. (vi) 50 mm dia M.S. clamps—2(Two) Pairs. (vii) 50 mmx 250 mm long G.I nipple- 1(One) no. (viii) Tube well cap for T/Well – 1(one) no. (ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>				<b>Rs.93,603.00</b>	

## Sub Est. No. 5

Estimate for the work - House service connection									
SUB-ESTIMATE									
S.No.	Description	Qty	Unit	Rate	Amount				
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.								
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82			
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall								
18.7.1	15 mm nominal bore	1.0	PM	Rs.138.70		Rs.138.70			
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil								
2.8.1		6.00	0.30	0.60	1.08	1.08	CuM	Rs.230.50	Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead							Rs.74.50	Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:								
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10			
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00			
5	Providing and fixing brass bib cock of approved quality :								
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00			
	Total					Rs.1,513.41			
	Say					Rs.1,513.00			

Total Nos. of House Holds=

200 Nos. @

Rs.1,513.00 Rs.302,600.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 200 HOUSE HOLDS

ESTIMATED COST-- Rs. 11.264 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 200 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 200 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	1025
2.	Intermediate Stage	2033	1400
3.	Ultimate Stage	2048	1775

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	1025	72	11	83
2033	1400	98	15	113
2048	1775	124	20	144

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (150mmx100mmx125m deep T/Well for rocky strata) :-	30 years
Electric motor & pumps	:- 15 years
Distribution network	:- 30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

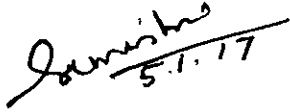
1. Provision for 150mmx100mmx125m deep T/Well for rocky strata.
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3.94 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 1126400.00 (Eleven lakhs twenty six thousand four hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost" and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

116

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 200 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 150mm x100mmx125m deep T/W for rocky strata etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.248,003.22
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico finished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distrbution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.457,981.30
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.302,600.00
<b>TOTAL</b>		Rs.1,115,227.53
Add 1% Contingency		Rs.11,152.28
<b>G. TOTAL</b>		Rs.1,126,379.80
<b>Say</b>		<b>Rs.1,126,400.00</b>

(Rs.Eleven Lakh Twenty six Thousand Four Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is accorded for Rs 1126400/- (Rupees eleven lacs twenty six thousand four hundred) only.  
 Submitted  
 5.1.17

**CONSTRUCTION OF 150MM X 100MM DIA & 125M DEEP TUBE WELL  
(For Rocky strata including Boulders)**

S.No.	Description	Qty.	Unit	Rate	Amount
1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level. (Rocky strata including Boulders)				
24.1.1.2	(a) 350mm dia bore from G.L. to 30.0M	30.0 M	P/M	Rs.859.70	Rs.25,791.00
24.1.1.1	(b) 300mm dia bore from 30.0 m to 60.0M	30.0 M	P/M	Rs.833.10	Rs.24,993.00
	(c) 300mm dia bore from 60M to 90.0M	30.0 M	P/M	Rs.833.10	Rs.24,993.00
24.2.1	(d) 300mm dia bore from 90.0M to 150.0M	35.0 M	P/M	Rs.881.20	Rs.30,842.00
2A	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
24.3.2	(a) 150 mm nominal size dia	30.0 M	P/M	Rs.615.30	Rs.18,459.00
24.3.1	(b) 100 mm nominal size dia	60.0 M	P/M	Rs.444.20	Rs.26,652.00
2B	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC (UPVC) medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
24.4.1	100 mm nominal size dia	30.0 M	P/M	Rs.468.80	Rs.14,064.00
3	Supplying the following fittings & fixing the same in position as per approved lowering assembly and strata chart including providing all equipments and welding the same on process of lowering the assay etc. all complete as per S/D of E/I.				
24.13.2	(a) 150 mm dia well cap	1 No.	Each	Rs.205.10	Rs.205.10
24.14.2	(b) 150 mm dia M.S. Clamp 1.6 M long (one Pair)	1 No.	Each	Rs.1,031.10	Rs.1,031.10
	(c) 150 mm dia center guide	4 Nos.	Each	Rs.150.00	Rs.600.00
	(d) 100 mm dia center guide	6 Nos.	Each	Rs.100.00	Rs.600.00
	(e) 150 mm x 100 mm dia 6mm wall thickness MS reducer	1 No.	Each	Rs.500.00	Rs.500.00
24.15.1	(f) 100mm dia & 6mm thick M.S. well shoe plug	1 No.	Each	Rs.205.60	Rs.205.60
4a	Providing all materials, labours, & equipments for fixing tube				
24.6	well with pea gravel of Dalbhumigarh to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tube well etc. all complete as per direction of E/I.	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.917.00	Rs.8,253.00
4b	Carriage of Pea Gravel from Dhalbhumigarh (taken av distance 400km.)	9.0 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,336.54	Rs.39,028.82

S.No.	Description	Qty.	Unit	Rate	Amount
5 24.12	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water sample & getting tested in approved laboratory, disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	24 Hrs.	Each	Rs.649.40	Rs.15,585.60
6	Transportation of drilling plants, developing equipments & all other required tools and M/c by and suitable mechanical means including all cost of loading, unloading, placing at work site and back after completion of work as per S/D of E/I	1 No.	Each	Rs.9,200.00	Rs.9,200.00
7	Supplying all materials and labours for arrangement for additional water required during the drilling period for 70 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I.	1 No.	Each	Rs.7,000.00	Rs.7,000.00
	<b>TOTAL</b>				<u>Rs.248,003.22</u>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

SIZE	
1.00 M	0.75 M deep

S.O.R. No.	Particulars	No.	L	W	H	Qty.	Unit	Rate	Amount
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
S.O.R. No. 6.1.12/1						0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
7	shuttering C.P. (1:3) with 5% Cico & neat cement	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
S.O.R. No.	Internal face	2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
+13.36.1	Bed surface	1	1.00	1.00		1.00 M <sup>2</sup>			
						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
10	Lifting Ring of 10mm dia Rod					0.338 M <sup>3</sup> x 70 Kg/M <sup>3</sup>	P/Kg	Rs.56.00	Rs.1,323.00
						4 No.	Each	Rs.30.00	Rs.120.00
11	Carriage of materials 5%							Total	Rs.12,418.89
									Rs.620.94
									<b>Rs.13,039.83</b>
								<b>Say</b>	<b>Rs.13,040.00</b>

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount	
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.					
	90mm dia Pipe	70.00	0.30	1.10 =	23.10	
	75mm dia Pipe	140.00	0.30	1.10 =	46.20	
	63mm dia Pipe	210.00	0.30	1.10 =	69.30	
	50mm dia Pipe	420.00	0.30	1.10 =	138.60	
	40mm dia Pipe	560.00	0.30	1.10 =	184.80	
				462.00 M <sup>3</sup>		
	Add 5% extra for fittings =			23.10 M <sup>3</sup>		
				485.10 M <sup>3</sup>		
1B	Provision for PCC road cutting and its restoration	15.75	M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.111,815.55
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.				Rs.3,901.40	Rs.61,447.05
		475.40	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50	Rs.35,417.15
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of, all taxes and duties (Exise duty @12.50% & CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.					
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)					
	90mm dia Pipe	70.00	M	P/M	Rs.340.84	Rs.23,858.80
	75mm dia Pipe	140.00	M	P/M	Rs.239.81	Rs.33,573.40
	63mm dia Pipe	210.00	M	P/M	Rs.168.77	Rs.35,441.70
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)					
	50mm dia Pipe	420.00	M	P/M	Rs.89.99	Rs.37,795.80
	40mm dia Pipe	560.00	M	P/M	Rs.59.78	Rs.33,476.80
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).					
	90mm dia Pipe	2 Nos.	Each		Rs.2,016.50	Rs.4,033.00
	75mm dia Pipe	2 Nos.	Each		Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each		Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each		Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each		Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount	
5	Constructing masonry Chamber 60x60x75 cm inside, in					
18.33	brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	11 Nos.	Each	Rs.5,807.50	Rs.63,882.50	
	Work for additional depth					
	Brick work (1:4) in foundation					
		2	1.10	0.25	0.35	0.193
		2	0.60	0.25	0.35	0.105
						0.298
	Plaster (1:3)	0.298	CuM	CuM	Rs.4,724.40	Rs.1,405.51
		8	1.10	0.35	3.08	3.08
6	Carriage 10% of item 5		SqM	SqM	Rs.128.20	Rs.394.86
						Rs.6,568.29
					TOTAL	Rs.457,981.30

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & (i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos (ii) 1x3x2.5 mm <sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs. (iii) 50 mm dia union socket- 1(one) no. (iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no. (v) 50 mm dia G.I Elbow—1(One) no. (vi) 50 mm dia M.S. clamps—2(Two) Pairs. (vii) 50 mmx 250 mm long G.I nipple- 1(One) no. (viii) Tube well cap for T/Well – 1(one) no. (ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control pannel operated on 220 V, 3 phase , 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&Tmake – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth , providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>					<b>Rs.93,603.00</b>

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97	Rs.119.82	
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nominal bore	1.0	PM	Rs.138.70	Rs.138.70	
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50	Rs.248.94	
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50	Rs.78.85	
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10	Rs.254.10	
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00	Rs.400.00	
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00	Rs.273.00	
	Total				Rs.1,513.41	
	Say				Rs.1,513.00	

Total Nos. of House Holds=

200 Nos. @

Rs.1,513.00 Rs.302,600.00



# GOVERNMENT OF BIHAR

PUBLIC HEALTH ENGINEERING DEPARTMENT

*MODEL ESTIMATE*

*FOR*  
CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME  
FOR A WARD HAVING 200 HOUSE HOLDS

ESTIMATED COST-- Rs. 9.721 Lac

JANUARY, 2017

**MODEL ESTIMATE FOR CONSTRUCTION OF RURAL PIPED WATER  
SUPPLY SCHEME FOR A WARD OF GP HAVING 200 HOUSEHOLD UNDER  
MUKHYA MANTRI GRAMIN PEYJAL NISHCHAY YOJANA.**

**REPORT**

“ Har ghar nal ka jal” Programme under seven policy resolutions titled “ Viksit Bihar ke liye saat Nischay” for inclusive development of the state, aims to provide safe drinking water to all the Rural and Urban households through tap house connection on ward basis within a period of next four years. This estimate for construction of Rural piped water supply scheme for a ward of GP having 200 households has been prepared by the Public Health Engineering Department as a model estimate in order to achieve the objective of the “ Har ghar nal ka jal” Programme in rural areas of the state with involvement and participation of panchayat and community in accordance with the technical guidelines approved by inter departmental committee under chairmanship of Engineer in Chief cum Special Secretary, PHED, Bihar for preparation of piped water supply schemes.

**2.0 DESIGN CRITERIA**

**2.1 POPULATION FORECAST**

Design population has been calculated based on decadal growth rate of the state i.e. 25% as per census population of 2011 and taking 5 members in a household. Accordingly population for initial stage i.e. base year 2018, Intermediate stage (2033) and ultimate stage (2048) are given below:-

S.No.	Stage	Year	Population
1.	Initial Stage	2018	1025
2.	Intermediate Stage	2033	1400
3.	Ultimate Stage	2048	1775

**2.2 DEMAND**

The rate of water supply has been taken @ 70 LPCD+15% as UFW and accordingly water demand for various stages are as under:-

Year	Population	Demand		
		@70 LPCD in KLD	UAF @ 15% in KLD	Total Demand in KLD
2018	1025	72	11	83
2033	1400	98	15	113
2048	1775	124	20	144

**2.3 DESIGN PERIOD**

Following design period has been adopted while designing the project-

Source (200/165mmx90m drilled T/Well)	:-	30 years
Electric motor & pumps	:-	15 years
Distribution network	:-	30 years

## 2.4 PEAK FACTOR

Peak factor of 3 has been taken for design purpose.

## 2.5 RESIDUAL PRESSURE

The minimum residual pressure at terminal points has been considered as 7M while designing the distribution network.

## 2.6 SOURCE

Ground water has been taken as source of water supply with provision of different type and size of tubewells based on its suitability as per site condition.

## 3.0 DETAILS OF PROPOSAL

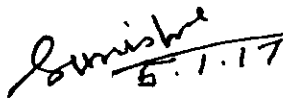
1. Provision for 200/165mmx90m deep drilled high yielding tubewell.
2. Provision for 3 HP submersible pump moter set with discharge capacity of 3.94 lps at 35m head.
3. Provision for laying of HDPE distribution Network has been made.
4. Provision of house connection for every household has been made.

## 4.0 ESTMATED PROJECT COST

The estimated cost of the project comes to Rs. 972100.00 (Nine lakhs seventy two thousand one hundred) only on the basis of current Bihar SOR and prevailing market rates for non scheduled items including 1% contingency. The abstract of cost and detailed estimates are under the chpater "Abstract of Cost" and "Detailed Estimates".

## 5.0 SPECIFICATION

All relevant standard specification of PWD, PHED of Govt.of Bihar will be followed during the execution of the work.

  
(S.C. Mishra)  
Chief Engineer (Design)

**GOVERNMENT OF BIHAR**  
**Public Health Engineering Department**  
**ABSTRACT OF COST**

128

**NAME OF WORK:- CONSTRUCTION OF RURAL PIPED WATER SUPPLY SCHEME FOR WARD HAVING 200 HOUSE HOLDS**

S.N.	Description	Total Amount
1	Construction of 200/165 mm dia. 90 Mtr deep Drilled High Yield Tubewell By DTH RIG Machine with Blue casing U.P.V.C. Pipe etc. all complete and as per direction of E/I. (As per sub Estimate no.- 1)	Rs.95,242.91
2	Constructing masonry Chamber 100x100x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for Tube Well, and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:2:4(1 cement : 2 fine sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3coarse sand) 12 mm thick with 5% cico fnished with a floating coat of neat cement, out side plastering with cement mortar 1:4 (1 cement : 4coarse sand) 12 mm thick complete as per standard specifications & direction of E/I. (As per sub Estimate no.- 2)	Rs.13,040.00
3	Providing and Laying High Density Polyethylene pipe (HDPE pipe) for Distribution network etc all complete as per direction of E/I. (As per sub Estimate no.- 3)	Rs.457,981.30
4	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & commissioning as per standards specifications and direction of E/I. (As per sub Estimate no.- 4)	Rs.93,603.00
5	Providing house connection for each house hold including supplying all materials, labours, tools and making ferrule connection with 20 mm dia MDPE and 15mm CPVC Pipes with all fittings etc all complete. (As per sub Estimate no.- 5)	Rs.302,600.00
<b>TOTAL</b>		Rs.962,467.21
Add 1% Contingency		Rs.9,624.67
<b>G. TOTAL</b>		Rs.972,091.88
<b>Say</b>		<b>Rs.972,100.00</b>

(Rs. Nine Lakh seventy two Thousand One Hundred ) only

**note:**

- i) Road cutting cost may increase or decrease as per actuals.
- ii) Strongly advised that pipeline should be laid before construction of Naali-Gali.
- iii) This is a model estimate. Hence the quantity may increase or decrease based on actual site conditions.

**Variable inter alia includes**

- i) Hydro geomorphological condition.
- ii) Location of source vis-à-vis population/ house holds.
- iii) Quality of works and materials shall be maintained as per standard specifications and direction of E/I.

Technical approval is recorded for Rs 972100/-  
(Rupees Nine Lakh seventy two thousand one hundred) only  
S. Mishra  
5.1.17

## Estimate no.- 1

2	<b>MODEL ESTIMATE OF CONSTRUCTION OF 200/165 MM DIA. 90 MTR DEEP DRILLED HIGH YIELD TUBEWELL BY DTH RIG MACHINE WITH BLUE CASING U.P.V.C. PIPE</b>					
3						
4	<b>S. NO.</b>	<b>Particulars</b>	<b>Quantity</b>	<b>unit</b>	<b>Rate</b>	<b>Amount</b>
5	1(A)	Drilling of 200mm x 165mm x 125 meter deep borewell in all kinds of soil and rock in rural area for installation of pump set with Hydaraulic DTH Rig machine, all complete including supplying all materials, tools, drilling rig, Air Compressor and equipments, as well as fuel, lubricants and cost of transportation of Rig machine and other vehicles up to the site etc all complete as per specification and direction of E/I.				
6		(i) Up to 50 mtrs depth below GL	50	P/M	Rs.729.52	Rs.36,476.00
7		(ii) Beyond 50 mtrs. Up to 90 Mtrs.	40	P/M	Rs.867.88	Rs.34,715.20
8	2	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC (UPVC) medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge. (200mm dia)	24	P/M	Rs.921.70	Rs.22,120.80
9	3	Supplying labour, cement and calcium chloride or betonites solution and equipments for grouting to casing pipe as per specification and direction of E/I.	1	Each	Rs.51.01	Rs.51.01
10	4	Supplying all tools labors and equipments and doing washing fiushing & developing of drilled tube well to give clean and clear water ( min. 2.50 Hours)all complete as per direction of E/I.	2.5	P/Hr	Rs 649.40	Rs 1,623.50
11	5	Supplying labors and equipments including 200 mm dia M.S. Cap & Fitting & Fixing over the tube well properly and taking out as per direction of E/I.	1	Each	Rs.256.40	Rs.256.40
12					<b>TOTAL</b>	<b>Rs.95,242.91</b>

(Sub Estimate - 2)

**Analysis of Chamber for TW**

Supplying materials, labours and constructing chamber of following dimension having 250mm thick wall in C.M. (1:4) including 12mm C.P. (1:3) with punning inside, R.C.C. cover slab with C.I. Surface box, 20mm dia foot rest at 150mm interval 10mm dia lifting ring etc. all complete.

<b>SIZE</b>	<b>1.00 M</b>	<b>x</b>	<b>1.00 M</b>	<b>x</b>	<b>0.75 M deep</b>
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<u>S.O.R. No.</u>	<u>Particulars</u>	<u>No.</u>	<u>L</u>	<u>W</u>	<u>H</u>	<u>Qty.</u>	<u>Unit</u>	<u>Rate</u>	<u>Amount</u>
1	Earth work in excavation	1	1.75	1.75	1.0	3.063 M <sup>3</sup>	P/M <sup>3</sup>	Rs.230.50	Rs.705.91
S.O.R. No. 2.8									
2	Sand filling	1	1.75	1.75	0.075	0.230 M <sup>3</sup>	P/M <sup>3</sup>	Rs.204.40	Rs.46.95
S.O.R. No. 2.28									
3	Brick flat soling	1	1.75	1.75		3.063 M <sup>2</sup>	P/M <sup>2</sup>	Rs.253.80	Rs.777.26
S.O.R. 11.72									
4	P.C.C. (1:2:4) in foundation	1	1.75	1.75	0.10	0.306 M <sup>3</sup>			
S.O.O. 4.1.3									
						0.306 M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,323.10	Rs.1,017.70
5	B/Work in (1:4) C.M.	2	2.50	0.25	0.75	0.938 M <sup>3</sup>	P/M <sup>3</sup>	Rs.4,724.40	Rs.4,429.13
S.O.R. No. 6.1.12/1									
6	R.C.C. Cover slab(1:1.5:3)	1	1.50	1.50	0.15	0.338 M <sup>3</sup>	P/M <sup>3</sup>	Rs.5,139.70	Rs.1,734.65
S.O.R. No. 5.2.2 & 5.9.3									
	shuttering	2	1.50	1.50	0.15	3.15 M <sup>2</sup>	P/M <sup>2</sup>	Rs.291.00	Rs.916.65
7	C.P. (1:3) with 5% Cico & neat cement								
S.O.R. Internal face		2	1.00	1.00	1.00	4.00 M <sup>2</sup>			
No. Bed surface		1	1.00	1.00		1.00 M <sup>2</sup>			
+13.36.1						5.00 M <sup>2</sup>	P/M <sup>2</sup>	Rs.166.30	Rs.831.50
8	C.P. (1:4) out side of wall	2	1.50	1.50	0.75	4.5 M <sup>2</sup>	P/M <sup>2</sup>	Rs.114.70	Rs.516.15
S.O.R. No. 13.11.2									
9	8mm dia T.S. Rod								
S.O.R. No. 5.22.7A									
			0.338 M <sup>3</sup> x	70	Kg/M <sup>3</sup>	23.625 Kg.	P/Kg	Rs.56.00	Rs.1,323.00
10	Lifting Ring of 10mm dia Rod					4 No.	Each	Rs.30.00	Rs.120.00
								Total	Rs.12,418.89
									Rs.620.94
11	Carriage of materials 5%								<u>Rs.13,039.83</u>

Say Rs.13,040.00

## Sub Est. No. 3

## WATER SUPPLY DISTRIBUTION SYSTEM

S.N.	Particulars	Quantity	Unit	Rate	Amount
1A	Earthwork in excavation over areas (exceeding 30 cm in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be levelled and neatly dressed.				
	90mm dia Pipe	70.00	0.30	1.10 =	23.10
	75mm dia Pipe	140.00	0.30	1.10 =	46.20
	63mm dia Pipe	210.00	0.30	1.10 =	69.30
	50mm dia Pipe	420.00	0.30	1.10 =	138.60
	40mm dia Pipe	560.00	0.30	1.10 =	184.80
					462.00 M <sup>3</sup>
	Add 5% extra for fittings =				23.10 M <sup>3</sup>
					485.10 M <sup>3</sup>
			P/M <sup>3</sup>	Rs.230.50	Rs.111,815.55
1B	Provision for PCC road cutting and its restoration	15.75	M <sup>3</sup>	P/M <sup>3</sup>	Rs.3,901.40
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	475.40	M <sup>3</sup>	P/M <sup>3</sup>	Rs.74.50
					Rs.35,417.15
3	Providing and laying High Density Polyethylene pipe (HDPE pipe) of 20 mm to 225 mm OD and pressure 6.0 Kg/cm <sup>2</sup> and 10 Kg/cm <sup>2</sup> suitable for water supply which is available in all standard, like ISI-4984/1995 and various grades like PE-80, PE-100 including required specials. Rates are inclusive of , all taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete as per direction of Engineer-in-charge.				
3A	HDPE pipe of materials grade PE100- PN10 (dia in mm)				
	90mm dia Pipe	70.00	M	P/M	Rs.340.84
					Rs.23,858.80
	75mm dia Pipe	140.00	M	P/M	Rs.239.81
					Rs.33,573.40
	63mm dia Pipe	210.00	M	P/M	Rs.168.77
					Rs.35,441.70
3B	HDPE pipe of materials grade PE100- PN8 (dia in mm)				
	50mm dia Pipe	420.00	M	P/M	Rs.89.99
					Rs.37,795.80
	40mm dia Pipe	560.00	M	P/M	Rs.59.78
					Rs.33,476.80
4	Providing and fixing brass gate valve with C.I. wheel of approved quality (screwed end).				
	90mm dia Pipe	2 Nos.	Each	Rs.2,016.50	Rs.4,033.00
	75mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	63mm dia Pipe	2 Nos.	Each	Rs.1,351.60	Rs.2,703.20
	50mm dia Pipe	2 Nos.	Each	Rs.811.40	Rs.1,622.80
	40mm dia Pipe	3 Nos.	Each	Rs.613.90	Rs.1,841.70

S.N.	Particulars	Quantity	Unit	Rate	Amount
5	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , necessary excavation, foundation concrete 1:5:10(1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard specifications & direction of E/I.	11 Nos.	Each	Rs.5,807.50	Rs.63,882.50
	Work for additional depth				
	Brick work (1:4) in foundation				
	2 1.10 0.25 0.35 0.193				
	2 0.60 0.25 0.35 0.105				
				0.298	
	Plaster (1:3)	0.298	CuM CuM	Rs.4,724.40	Rs.1,405.51
	8 1.10 0.35 3.08	3.08	SqM SqM	Rs.128.20	Rs.394.86
6	Carriage 10% of item 5				Rs.6,568.29
				<b>TOTAL</b>	<b>Rs.457,981.30</b>

## Sub Est. No. 4

Model estimate for supply, installation & commissioning of single phase 3 H.P submersible motor pump set with all accessories including extension of L.T. line from nearest source up-to pumping station.

Sl. No.	Particulars	Quantity	Unit	Rate	Amount
1	2	3	4	5	6
[A.]	Supply Installation, commissioning and testing of single phase 3 H.P. submersible pump set having discharging capacity 3.94 lps at a total head of 35 meter(approx) of KSB/ Kirloskar or equivalent make with all accessories & fittings etc including loading unloading and transportation of the pump set to the work site with all required labour, materials, tools and tackles installation, testing & (i) 50 mm dia x 3 mtrs long medium class G.I column pipe both end thread and one end socketed- 6(six)nos (ii) 1x3x2.5 mm <sup>2</sup> flat copper conductor submersible cable -40 (forty) mtrs. (iii) 50 mm dia union socket- 1(one) no. (iv) 65 mm dia x 250 mm long G.I. nipple- 1 (one) no. (v) 50 mm dia G.I Elbow—1(One) no. (vi) 50 mm dia M.S. clamps—2(Two) Pairs. (vii) 50 mmx 250 mm long G.I nipple- 1(One) no. (viii) Tube well cap for T/Well – 1(one) no. (ix) 50 mm dia x 65 mm dia reducer socket –1(one) no.	1 (one) job	p/job	Rs.42,700.00	Rs.42,700.00

[B]	Supply Installation, commissioning and testing of floor mounted outdoor type L.T feeder pillar single phase starter control panel operated on 220 V, 3 phase, 50 c/s for 3 HP Submersible pump set made of MS sheet (minimum 2 mm thick) duly spray power coated painting with following accessories made of M.S sheet ( minimum 2mm thick) duly spray powder coated painting with following accessories (i) 90-220 V range single phase 7.5 KVA automatic voltage stabilizer make- Sen & Pandit/ Vertex/ISI marked If any. 1 No.  (ii) Suitable single phase starter control panel for above motor of BCH /L&T make – 1(one) no.	1 (one) job	p/job	Rs.45,500.00	Rs.45,500.00
[C]	Supplying & fitting 2.5 mm <sup>2</sup> copper service cable from power point from nearest source up-to pumping station..	20 mtrs	P/Mt	Rs.130.00	Rs.2,600.00
[D]	Providing all materials and labour required for doing earthing station with G.I earth pipe of 40 mm dia x 4.5 mtrs 20fts. long G.I pipe including accessories excavation of earth, providing masonry enclosure with cover plate having locking arrangement and watering pipe etc.with salt, charcoal,etc.as per IE & IS specification.	1 job	p/job	Rs.2,803.00	Rs.2,803.00
<b>Total Rs.</b>				<b>Rs.93,603.00</b>	

## Sub Est. No. 5

Estimate for the work - House service connection						
SUB-ESTIMATE						
S.No.	Description	Qty	Unit	Rate	Amount	
1A	Providing and fixing MDPE (PE 80 GradeCompound) pipes PN-12.5 (12.5kg/Sqcm) as per ISO 4427 and specification for waterapplication rates are inclusive of , taxes and duties (Exise duty @12.50% &CST @2% against Form 'C'), labour cess, contractor profit and overhead charges all complete asper direction of Engineer-in-charge.complete.					
	MDPE Pipe 20mm dia nominal bore	6.00	PM	Rs.19.97		Rs.119.82
1B	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
18.7.1	15 mm nomonal bore	1.0	PM	Rs.138.70		Rs.138.70
2	Earth work in excavation in foundation trenches or drains(not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and amming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil					
2.8.1	6.00 0.30 0.60 1.08	1.08	CuM	Rs.230.50		Rs.248.94
3 2.26	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead	1.06	CuM	Rs.74.50		Rs.78.85
4	Providing and fixing brass ferrule with CI mouth cover incuding boring and tapping the main:					
18.20.1	15mm nominal bore	1	Each	Rs.254.10		Rs.254.10
	Providing and fixing P.P. Black service Saddle (Brass threaded)	1	Each	Rs.400.00		Rs.400.00
5	Providing and fixing brass bib cock of approved quality :					
18.15.1	15mm nominal bore	1	Each	Rs.273.00		Rs.273.00
	Total					Rs.1,513.41
	Say					Rs.1,513.00

Total Nos. of House Holds=

200 Nos. @

Rs.1,513.00 Rs.302,600.00