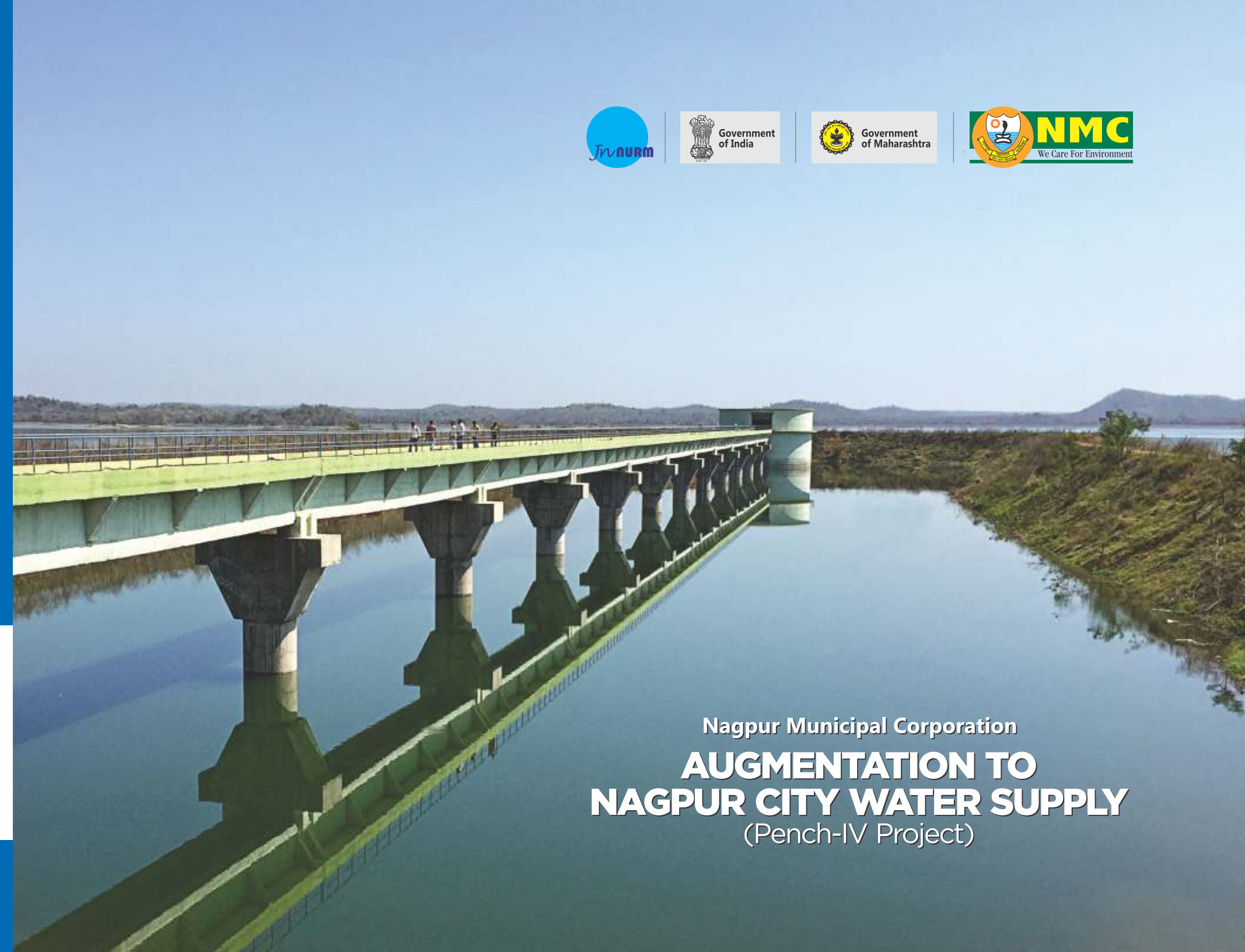




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Nagpur Municipal Corporation  
**AUGMENTATION TO  
NAGPUR CITY WATER SUPPLY**  
(Pench-IV Project)



WTP 115 MLD



Pump house & Access Bridge

Raw Water Pumps

Elevated Service Reservoir

Nagpur Municipal Corporation  
**AUGMENTATION TO  
NAGPUR CITY WATER SUPPLY**  
(Pench-IV Project)



Kanhan Bridge



# AUGMENTATION TO NAGPUR CITY WATER SUPPLY (Pench-IV Project)

## Need of the Project

- Pench Water supply 470 Mld by canal
- Water losses in Canal ranging from 100-225 Mld
- Augmentation to Water Supply of Nagpur city to meet the demand of newly developed area.

## Benefit of the project

- Due to Conveyance of water through pipeline, instead of previously through open canal saving in quantum of water by 20-25%.
- Time availability for Canal maintenance will improve irrigation efficiency.
- Availability of additional water for irrigation & drinking to meet the NMC water demand upto-2021
- Annual saving to NMC in Raw Water Tariff @Rs.8.70 crores
- Energy saving to NMC

## Awarded Cost

- Pench IV- Projects – Rs.58444.75 Lakh

## Source of Funding

- Government of India (GOI) – Rs. 19589.69 Lakh
- Government of Maharashtra (GOM) – Rs. 7835.88 Lakh
- Nagpur Municipal Corporation (NMC) – Rs. 31019.18 Lakh

## AUGMENTATION TO NAGPUR CITY WATER SUPPLY SCHEME, PENCH-IV

## PART - I



Intake Well



Break Pressure Tank



2300mm MS Pipe Line Railway Crossing

### Pench-IV-Part-1- Lifting and Conveyance of water from pench dam (NAG-002)

#### Salient Features

##### 1. Intake Tower

- Capacity- 630 MLD
- Inner Dia of Intake Well 18m
- Height of R.C.C. structure- 28m

##### 2. Connecting Pipe

- Capacity- 630 MLD
- Twin Conduit pipe line
- RCC- NP4 class pipe
- Dia- 2200 mm ID
- Length- 350m x 2 rows

##### 3. Access Bridge (From Intake Tower to Pump house)

- Width -4.00m
- Length- 380m
- No of pier – 14 nos
- Dia of pier – 2 m
- Span of pier – 25 m

##### 4. SUMP CUM PUMP HOUSE Civil works

- Capacity- 630 MLD
- Size- 25 m X 50 m
- Height of R.C.C structure - 31 m

#### Mechanical works

- Pumps - 8 Nos.(86.83 MLD discharge for total head of 43 m)
- Motors - 8 Nos (580 KW)

#### Electrical Works

- Soft Starters - 8 Nos.
- HT (3.3.kv) and L.T. Panel (0.415 kV) - 8 Nos.

#### 5. SUBSTATION

- Size - 28 x 28 m
- Transformers (5.5.Mva) - 2 No
- 4 Pole structures - 1 no
- 4. 33 Kv H.T. Panel - 1 no.

#### 6. RAW WATER PUMPING MAIN

- Diameter of pipe - 2032 mm + 2300 mm
- Material of pipe - M.S.
- Length – 97 m + 386 m
- Length – 483 m
- Scour Valve – 1 no (400 mm dia)
- Butterfly Valve – 1 no (2000 mm dia)
- Air Valve with isolating sluice valve – 1 no ( 200 mm dia)

#### 7. BREAK PRESSURE TANK

- Capacity- 630 MLD
- Inner dia - 8m
- Height - 15 m
- H.G.L. at B.P.T - 349 m

#### 8. RAW WATER GRAVITY MAIN

- Outer Dia - 2300 mm
- Material of pipe - M.S.
- Length - 27640 m (approx)
- Scour Valve – 15 nos (400 mm dia)
- Air Valve – 63 nos (200 mm dia)
- Butterfly valve – 6 nos (1500 mm dia)

#### 9. KANHAN RIVER PIPE LINE BRIDGE

- Total length- 452m
- Width- 10.34 m including 3.75 m Motor able Way
- Pier Span - 21 m c/c.
- No of Piers - 21 Nos. and 2 end column

#### 10. KOLAR RIVER PIPE LINE BRIDGE

- Total length- 140 m
- Width- 9.40 m including 3.00 m Motor able Way
- Pier Span - 20 m c/c

- No of Piers -5 Nos and 2 end columns

#### 11. AMAGAON NALLA PIPE LINE BRIDGE

- Total length- 40 m
- Width- 3.10 m (Only pipe carrying bridge)
- Pier Span- 10 m c/c

#### 12. POWER SUPPLY 33 KV

- Total Demand 4000 KVA – Total Length 18 Km

#### Awarded Cost

- Pench IV- Part -1 – Rs.22061.00 Lakh

#### Source of Funding

- Government of India (GOI) – Rs. 7231.85 Lakh
- Government of Maharashtra (GOM) – Rs. 2892.74 Lakh
- Nagpur Municipal Corporation (NMC) – Rs. 11936.41 Lakh





Aeration Fountain

### Pench-IV-Part-2- Conveyance of Water from Mahadulla to WTP to MBR and WTP of 115 MLD & pumping machinery (NAG-012).

**Package – 1** Conveyance of Water from Mahadulla to WTP to MBR

#### Salient Features

- Raw water transmission main : 1400 mm dia M.S pipe line – 2.90km  
Pure water transmission : 1422mm dia M.S pipe line – 9.30 km
- Valve complex – 1no

## AUGMENTATION TO NAGPUR CITY WATER SUPPLY SCHEME, PENCH-IV

## PART - II



Sludge Tank



115 mld WTP



Recycling Tank

**Package – 2-** WTP of 115 mld and Pumping Machinery

#### Salient Features

##### 1. Cascade Aerator

- No. of Aerator – 01 No
- Design Flow – 5750 m3/hr

##### 2. Multi flow classic

###### a) Coagulation Tank

- No. of Coagulation Tank – 01 No.
- Size of Tank – (4.8 x 4.8x 8.0 Depth)
- Retention time - 01 / tank

###### b) Flocculation tank

- No. of flocculation tank – 03.nos.
- Size of each Tank – (9.0 x 9.0x 8.2 Depth) m
- Volume of each Tank – 664.2 m3
- Retention time at nominal flow – 23.1min

###### c) Settling Tank

- No. of Setting Tank – 03. nos
- Settler Width – 9.0 m
- Settler zone length – 14.0 m
- Lamella surface area of each tank.- 119.65 m2
- Settling time – 30.0 min.

##### 3. TGV Filter

- No. of Filters – 04+01 Standby
- Filtration velocity at nominal flow (N) – 8.05m/h

- Filtration velocity at N-1 Filters – 10.06 m/h (01 filter under backwash)
- Filtration velocity at N-2 Filters – 13.41 m/h (01under backwash, 01 standby)

##### 4. Backwash Pumps

- Back wash pump – 3W+15
- Duty conditions – 2500 m3/hr, 7.75 m Head

##### 5. Recirculation water Tank

- No.of Tank – 01 No. (2 compartments in 1 cell)
- Capacity – 2500 m3

##### 6. Clear water reservoir / Chlorine Contact Tank

- Maximum water flow – 4808 m3 / hr
- No. of Tank – 01 no
- No of compartment – 02.nos
- Net capacity of clear water – 4800.00 m3

##### 7. Wet Well & Pure Water Pumping Station

- Total depth – 6.80m
- Discharge of each pump (VT) – 2400 m3 / hr
- Total Dynamic Head (TDH) 33.80m
- Expected Motor Power-300 kw

- Total no. of pumps – 02+02 (Standby)
- Treated Water Outlet – 1400 mm pipeline.

##### 8. Chemical Dosing & storage

###### a) PACL

- Dosing rate – 30mg/l average, 80mg/l maximum
- PAC required per day – 9936 kg/day (Max. dosage)
- PACL liquid storage time – 15 days.

###### b) Polymer

- Dosing rate – 0.2 mg/l Maximum
- Capacity of Dosing pump – 200 lph

###### c) Chlorine

- Raw Water Flow - 5175 m3/h : Nominal flow (Including recirculation flow), 5750 : Peak flow
- Pre Dosing rate - 1.0 mg/l
- Post Dosing rate - 3.0 mg/l
- No. of Pre-Chlorinators - 01 + 01 (Standby), 10 kg/h
- No. of Post-Chlorinators- 01 + 01 (Standby), 20 kg/h.

##### 9. Sludge Treatment System

###### a) Clarifier Sludge Sump

- Sludge Volume - 3153.2 m3/day

- Sludge retention time - 15 min.
- b) Thickener Feed Pumps
- No. of pumps - 02 + 01 (Standby)
- c) Sludge Thickeners
- Sludge Inlet to Thickeners - 6341.1 kg/day
- Sludge loading rate - 50 kg/m2/day
- d) Polyelectrolyte Dosing For Thickeners
- Dosing rate - 1.00 kg/t of Dry Solids
- Poly required - 6.3 kg/day
- e) Centrifuge Feed Pumps
- Centrifuges
- Qty. of Sludge - 5707 kg/d
- Capacity of Centrifuge - 9.0 m3/hr
- f) Polyelectrolyte Dosing For Centrifuge
- Dosing rate - 5.50 kg/t of Dry Solids
- Poly required - 31.4 kg/day
- Project Awarded Cost-Rs.11004.26.00 Lakh

#### Source of Funding

- Government of India (GOI) - Rs. 3098.00 Lakh
- Government of Maharashtra (GOM) - Rs. 1239.20 Lakh
- Nagpur Municipal Corporation (NMC) & Public Private Partnerships (PPP) - Rs. 667.06 Lakh





Water Source - Pench Dam, Navegoan, Khairy





**AUGMENTATION TO NAGPUR CITY WATER SUPPLY SCHEME, PENCH-IV PART - III**



Bridge for Feedermain



ESR



Pardi Bridge Feeder Main

**Pench-IV-Part-3- Laying of Feeder Mains and Design & Construction of ESRs / GSRs (24nos) – (NAG-013).**

**Package- 1 -**  
Laying of Feeder Mains from MBR to ESR

**Salient Features**  
I M.S pipe length – 15.39 km  
ID.I – K9- pipe length – 21.13 km

**Package- 2 -**  
Design & Construction of ESRs/GSRs -22-ESR & 2-GSR

**Salient Features**

Sr.No.	ESR/GSR Name	Capacity	Staging Height
1.	Shantinagar	2.27 ML	21 M
2.	Nanadanvan-I	2.27 ML	21 M
3.	Kharbi	2.27 ML	21 M
4.	Sakkardara	2.27 ML	21 M
5.	Pratapnagar	2.27 ML	21 M
6.	Indora-I	2.27 ML	21 M
7.	Indora-II	2.27 ML	21 M
8.	Binaki-I	2.27 ML	21 M
9.	Binaki-II	2.27 ML	21 M
10.	Bastarwari-I	2.27 ML	21 M
11.	Nandanvan-II	2.27 ML	21 M
12.	Bandewadi	2.27 ML	18 M
13.	Jaitala GSR	1.5 ML	-
14.	Bastarwari-II	2.27 ML	21 M
15.	Pardi-I	2.27 ML	21 M

16.	Pardi-II	2.27 ML	21 M
17.	Omkarnagar	2.27 ML	21 M
18.	Hanumannagar	2.27 ML	21 M
19.	Seminary hill	2.27 ML	18 M
20.	Trimurtinagar	2.27 ML	18 M
ESR/GSR yet to be complete			
21.	Babulvan	2.27 ML	21 M
22.	Srinagar	2.27 ML	21 M
23.	Nalanda Nagar	2.27 ML	21 M
24.	Gorevada GSR	3.0 ML	-

- Project Awarded Cost - Rs.9755.53 Lakh
- Government of India (GOI) - Rs. 4029.50 Lakh
- Government of Maharashtra (GOM) - Rs. 1611.80 Lakh
- Nagpur Municipal Corporation (NMC) - Rs. 4114.23 Lakh



Nagpur City - Water Distribution Command Areas

**AUGMENTATION TO NAGPUR CITY WATER SUPPLY SCHEME, PENCH-IV PART - IV**



Distribution Pipe - DI      Hydro Testing - Distribution Pipe      Connecting ESR with Distribution

**Pench-IV-Part-4-** Distribution system (Proposed And Up-Gradation of Existing System Of Different ESRs) in Nagpur City (NAG-014)

**Salient Features** • Distribution system : 270.00 km

Details of Pipe line laid – C.I/ D.I.K-9 - 100 mm dia to 600 mm dia		
1. Package-	1A & 1B	61.76 km
2. Package-	2A & 2B	77.76 km
3. Package-	3B	34.17 km
4. Package-	4A & 4B	71.814 km
5. Package	5B	24.48km
<b>Total</b>		<b>270.00 km</b>

**Sump & Pumps**

Sr. no	Name of Pump House	Capacity	Nos. Of Pumps	Discharge (Lts / Sec)	Total (HP)
1.	Jaitala GSR Pump House	1.5ML	03Nos	81.76	75
1.	Takli Seem ESR	0.3ML	02Nos	81.76	50

- Project Awarded Cost - Rs.15623.96 Lakh
- Source of Funding**
- Government of India (GOI) - Rs. 5230.34 Lakh
- Government of Maharashtra (GOM) - Rs. 2092.14 Lakh
- Nagpur Municipal Corporation (NMC) - Rs. 8301.48 Lakh

Pipeline at the time of Construction



## AUGMENTATION TO NAGPUR CITY WATER SUPPLY SCHEME, PENCH-IV

## PARTNERS



WTP 115mld Under Construction













ESR Under Construction



Installation for Flow Meter

### Pench-IV - Contractors & Consultant

Sr.No	Project Name	Award Cost	Logo	Contractors Name					
1.	<b>Lifting and Conveyance of water from pench dam (NAG-002) - Part-1</b>	Rs. 22061.00 Lakh		<b>CRSGC-SEW-JV</b> • M/s China Railway Shisiju Group Corporation Ltd. (CRSGC) • M/s. SEW Infrastructure Ltd.	3.	<b>Laying of Feeder Mains and Construction of ESRs / GSRs (24nos) (NAG-013) - Part-3</b>			
						<b>Package-I-</b> Laying of Feeder Mains from MBR to ESR	Rs. 5825.12 Lakh		• M/s SMC Infrastructure Pvt. Ltd.
						<b>Package-II-Design &amp; Construction of ESRs/GSRs</b>	Rs.3930.41 Lakh		• M/s. S.K Banerjee Builders, Engineers & Contractors.
2.	<b>Conveyance of Water from Mahadulla to WTP to MBR and WTP of 115 MLD &amp; pumping machinery (NAG-012) -Part-2</b>				4.	<b>Distribution system (Proposed and Up-Gradation Of Existing System Of Different ESRs) in Nagpur City (NAG-014)</b>	Rs.15623.96 Lakh		• M/s. Central India Engineering
									• M/s. Sonu Construction
									• M/s. Rohan Construction Engineer and Contractors
	<b>Package-1</b> Conveyance of Water from Mahadulla to WTP to MBR	Rs. 3080.26 Lakh		• M/s Sheth & Sura Engineers Pvt. Ltd.					• M/s. Murlidhar & Company
	<b>Package-2</b> WTP of 115 mld and Pumping Machinery	Rs. 7924.00 Lakh		• M/s Veolia Water (India) Pvt. Ltd.		<b>Total Awarded Cost</b>	<b>Rs.58444.75 Lakh</b>		
					5.	<b>Project Management Consultant( PMC)</b>	<b>Rs.1586.00 Lakh</b>		• M/s. DRA Consultant Pvt. Ltd., - STC JV.

