

TECHNICAL DOCUMENT MODEL FOR -  
EXECUTION OF RURAL PIPED WATER SUPPLY  
PROJECTS PERTAINING TO MAHANGA BLOCK OF  
CUTTACK DISTRICT INCLUDING FIVE YEARS  
OPERATION & MAINTENANCE.

PHANS4 CONSULTING PVT. LTD.

## **BACKGROUND: -**

The E.I.C., R.W.S.S, Odisha is engaged in the development of water supply and as part of this endeavor; the Authority has decided to undertake “The work “Execution of Rural Piped Water Supply Projects pertaining to Cuttack District including five years Operation & Maintenance” on EPC mode” through an Engineering, Procurement and Construction (the "EPC") Contract.

1. Mega PWS scheme to Mahanga block of Cuttack district

## **INTRODUCTION: -**

The Proposed project block has following scenario :-

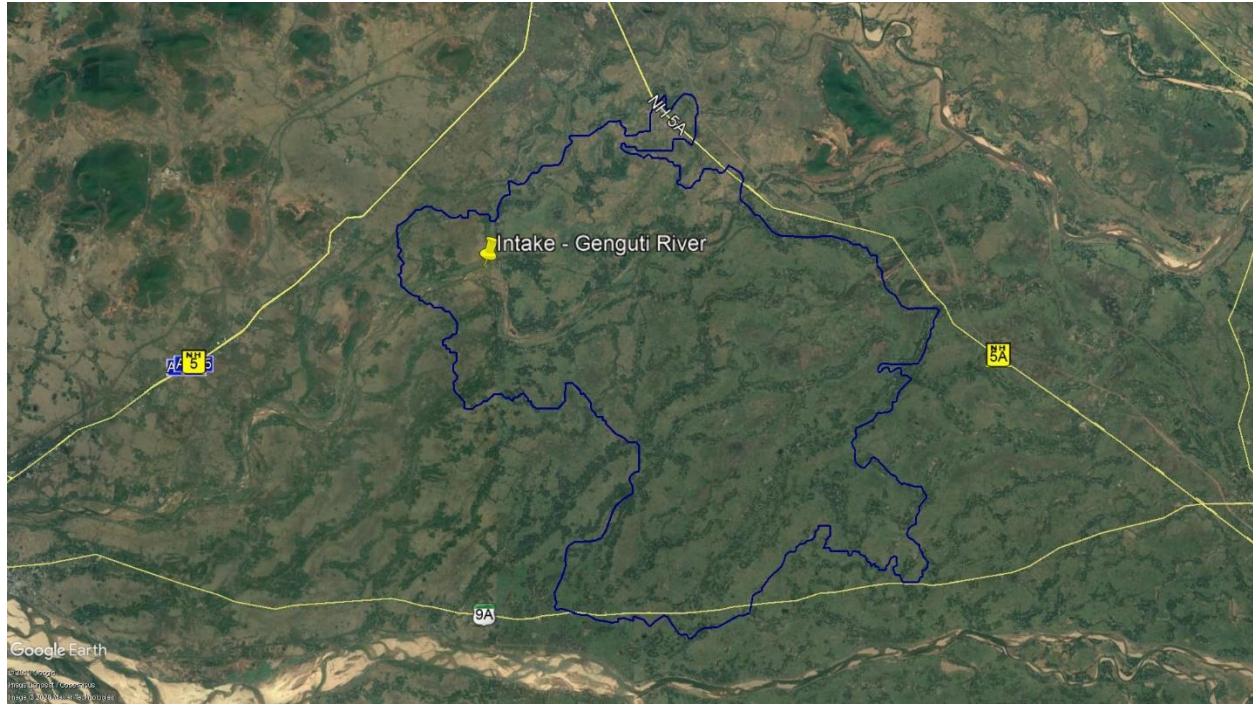
1. MAHANGA BLOCK has 41 G.P's and 211 Villages.

The project should include water supply to 211 villages & 41 G.P's in mahanga block of cuttack district. The existing infrastructures of the commissioned/ completed PWS schemes are to be utilized in maximum as per requirement. The system comprises of Intake well, Jackwell, raw water pump house and pumping machineries, raw water rising main pipelines, water treatment plants, clear water sumps, clear water pump house and pumping machineries, clear water rising/gravity main up to ELSR's/UGR's and distribution piping from ELSR's/UGSR's to habitations in the villages.



## **INTAKE SOURCE FOR THIS PROJECT:**

- Genguti River



## **PROJECT DELIVERABLES:**

- Headworks and intake structure
- Raw water pumping main
- Water treatment plant
- Clear water reservoir/sump and pumping station
- Clear water transmission/gravity mains
- Booster pumping stations
- Storage reservoirs (ESR's/ UGSR's)
- Distribution system up to village habitation street level

**BASIC DESIGN PARAMETERS: -**

S.No.	Items	Numericals	Units
1	Per Capita Demand	70	Lpcd
2	Pumping Time For Raw Water	20	Hrs
3	Operating Time Of WTP	20	Hrs
5	Filling Time Of OHSR	12	Hrs
6	Distribution	8	Hrs
7	Design Period For Pumping Machinery	2037	year
8	Design Period For Distribution Network	2052	year
9	Design Period For Civil Works	2052	year
10	Base Year	2022	year
11	Population For 2022		
A	<b>MAHANGA BLOCK</b>	PROJECTION	People
	<b>Total Population</b>	PROJECTION	People
12	Demand	70	LPCD
13	Wastage And Institutional Demand	15	LPCD
14	Population Growth Rate Per Decade	14	%

**PROPOSED HYDRAULIC DESIGN:**

The proposed Piped Water Supply Project **“to cover ( 211 Villages of 41 GPs in mahanga Block”** has been prepared comprising the Construction of Intake, Water Treatment Plant, Storage Reservoirs, Rising Mains both Raw Water & Clear Water and necessary distribution pipe network etc. considering the need of the consumers of different water supply zones for ultimate design year for 30 years taking 2022 as base year.



### **For MAHANGA BLOCK**

- Rate of supply to the villages: (70 lpcd + 15lpcd UFW) including wastage and institutional demand.
- Calculated water demand of ultimate design years 2052 is about ----- MLD.
- Calculated water demand of intermediate design years 2037 is about ----- MLD.
- Clear water sump at WTP: ----- KL.
- Raw water and clear water pumping machineries design for intermediate year of 2037 demand conditions.
- Raw water Rising main material: D.I -K-7/9.
- Raw water pumping : 20 hours /day.
- Design flow : Ultimate design flow based on 2052 year.
- Clear water Pumping mains/ Gravity mains : D.I K-9 / K-7/HDPE.
- Clear water pumping mains design : 16 hours /day.
- Hazen-Williams Roughness coefficient considered as mentioned in CPHEEO manual
- Pipe diameter below 160mm will be HDPE and above will be D.I of K-7/ K-9 class
- Suitable pressures and velocity considered as per system requirement
- Suitable Surge protection, Reservoir management for effective control of flow in to the ESR's/ UGR's, Air management, Pump house Automation, Automatic meter readings for house service connections, inline valves such as butterfly valve, scour valve of suitable size, thrust blocks, crossing structures considered properly.
- Web based online monitoring system is considered and it will be based on wireless and energyless operation.

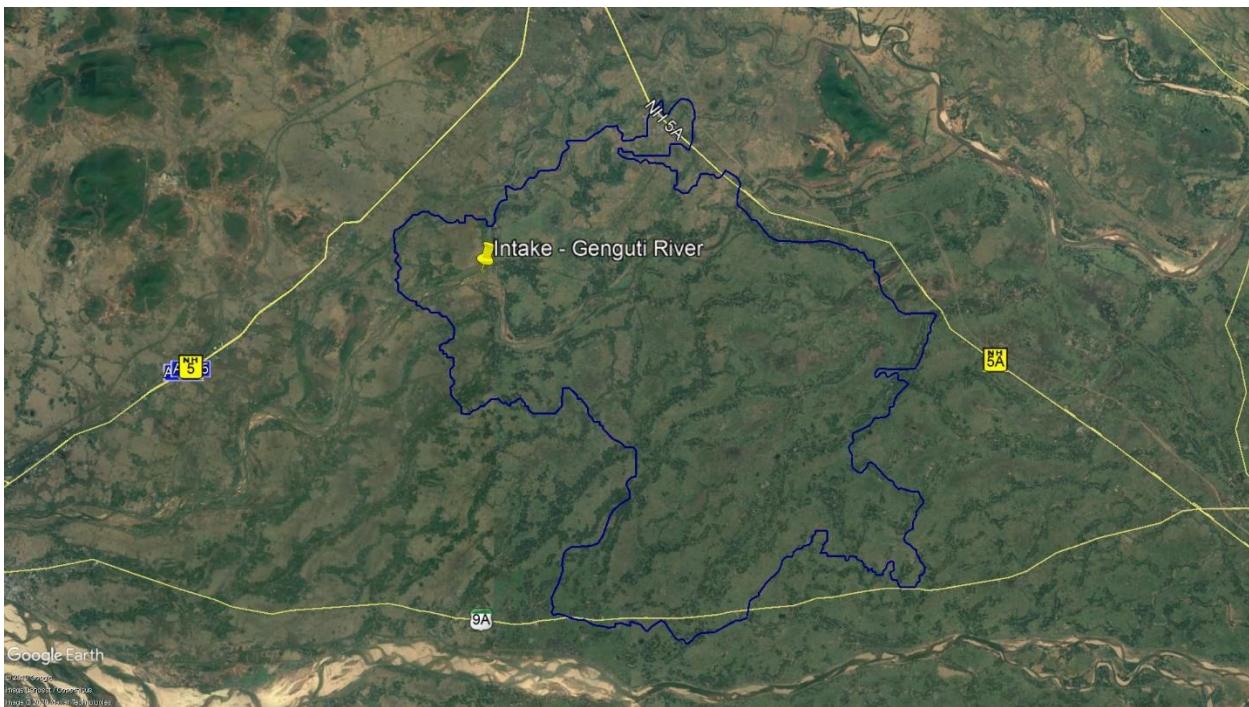
### **INTAKE SOURCE LOCATION COORDINATES FOR MAHANGA BLOCK**

<b>Source</b>	<b>Coordinates</b>
Genguti River	AS PER SITE VITE

## RAW WATER INTAKE FOR MAHANGA BLOCK

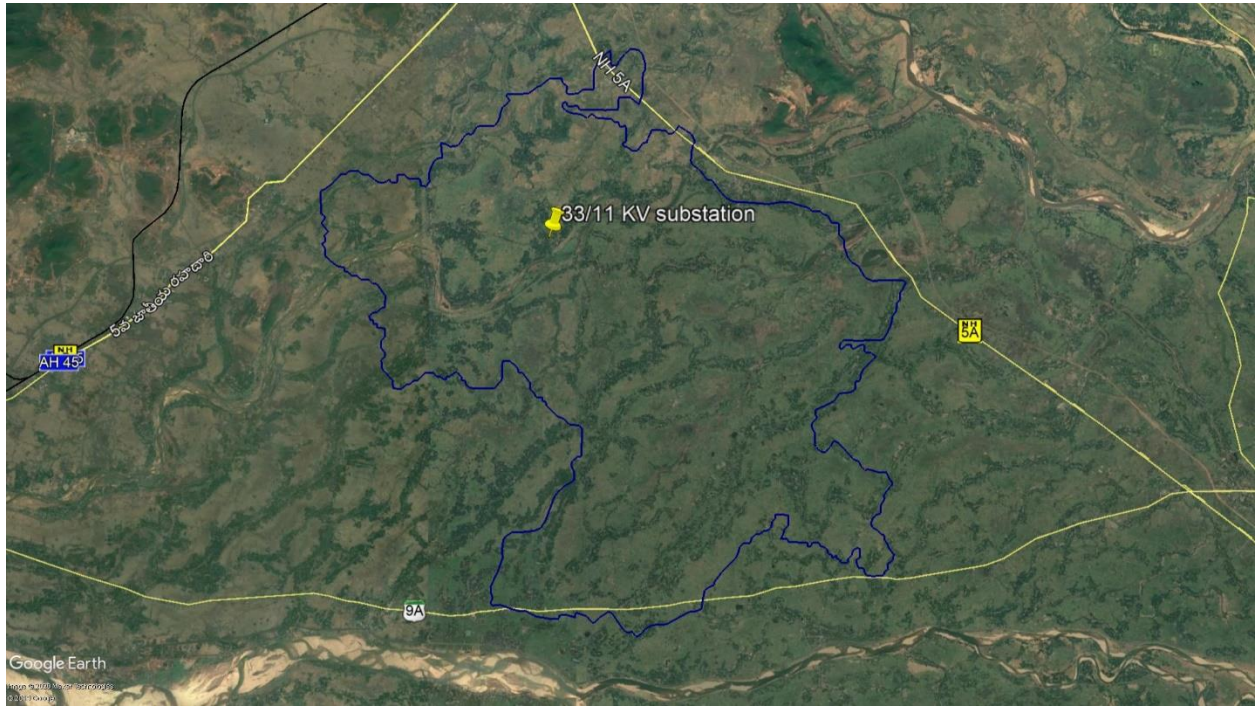


## SUBMERGENCE IN MAHANGA BLOCK





**INTAKE TO WTP PATH LOCATION IN MAHANGA BLOCK**

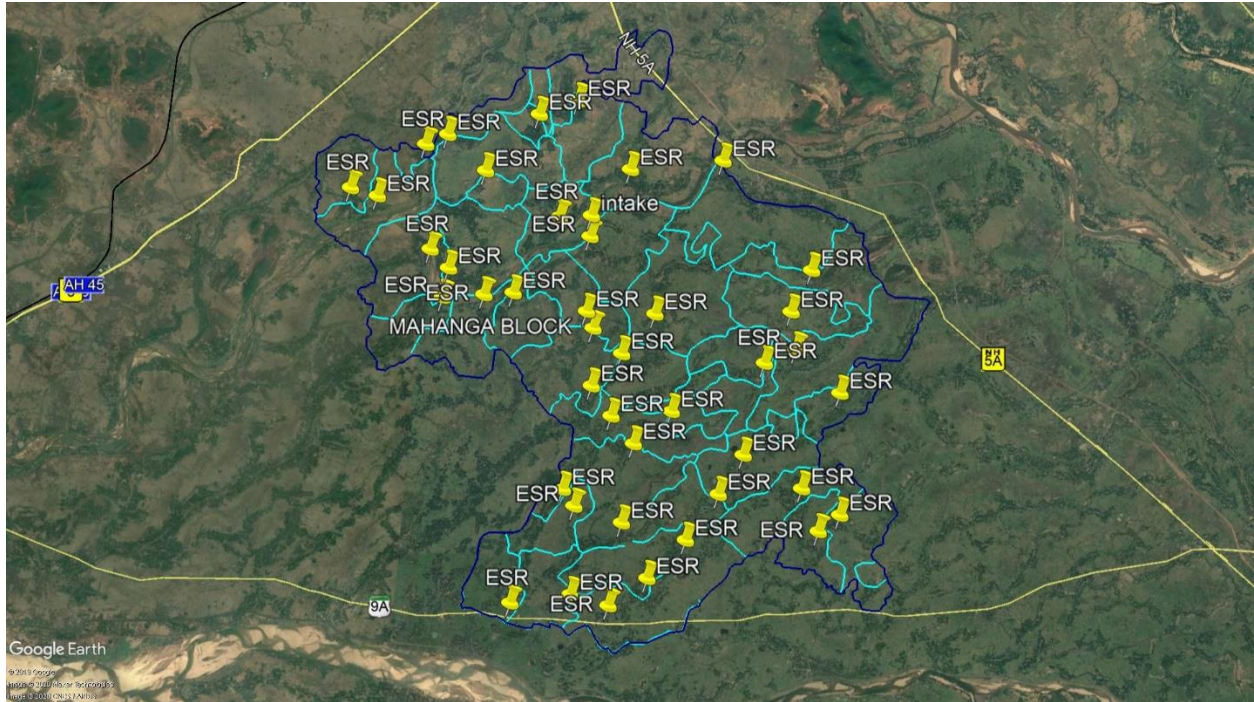


**33 / 11 KV SUBSTATION IN MAHANGA BLOCK**

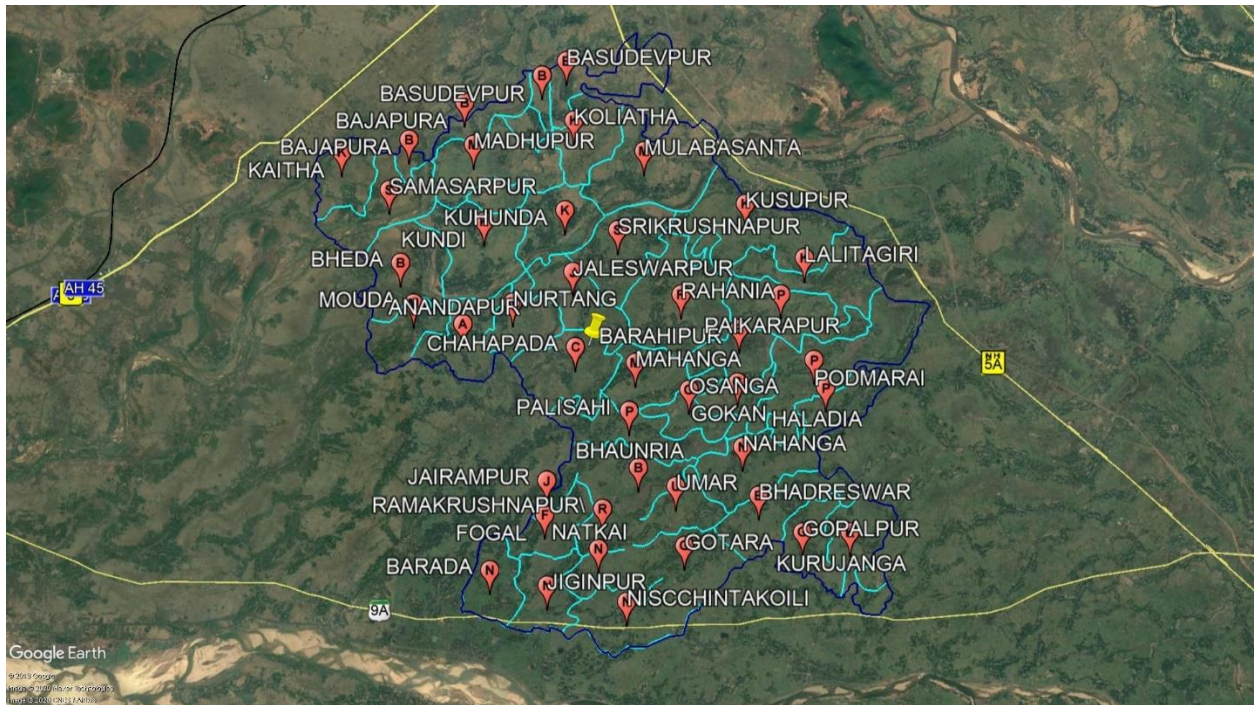




## MAHANGA BLOCK G.P BORDERS

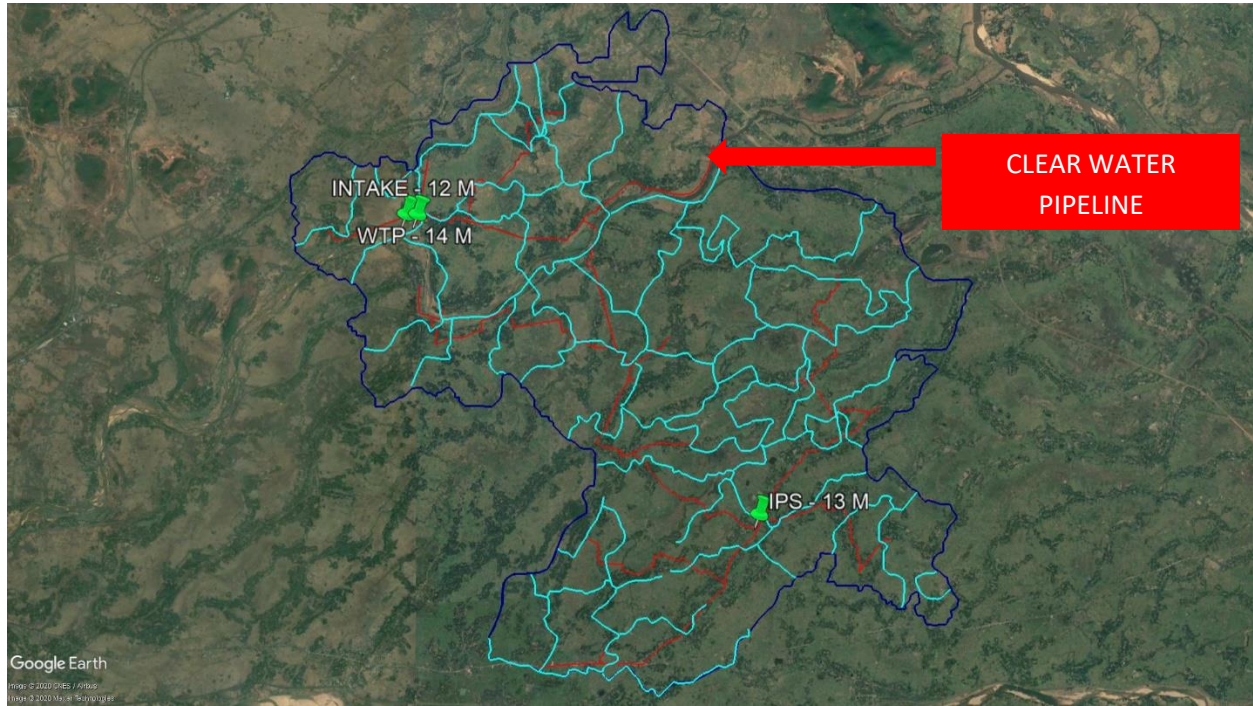


## MAHANGA BLOCK – ESR LOCATIONS

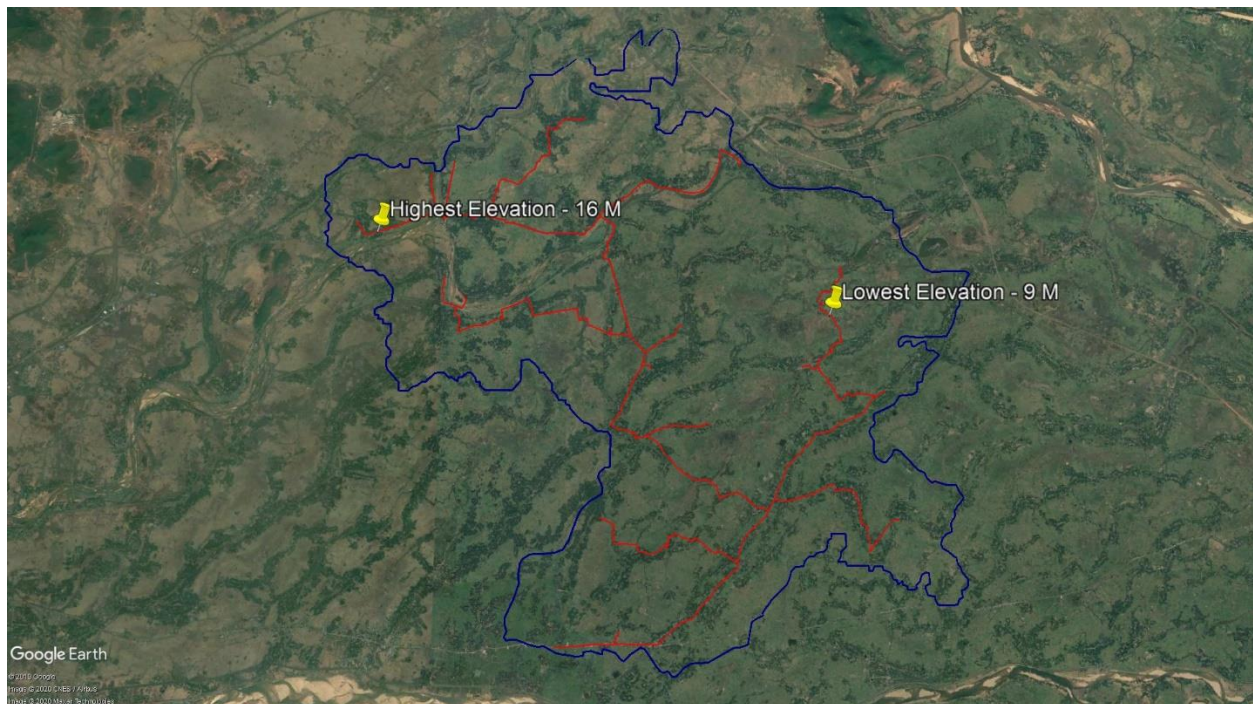




## MAHANGA BLOCK - CLEAR WATER PIPELINE WITH IPS



## MAHANGA BLOCK ELEVATION PROFILE OF CLEAR WATER NETWORK



HYDRALIC DESIGN DATA IS GENERATED IN EXECEL

DATA SHEETS AND ATTACHEMENTS ARE ALSO ATTACHED AS  
PER APPENDIX IN THE TENDER DOEUMENT



*PHANS4 CONSULTING  
PVT. LTD.*

# WATER RESOURCE & IRRIGATION SECTOR BROCHURE



*WATER RESOURCE & IRRIGATION*

# AN OVERVIEW

## About us

Phans4 is engaged in global consulting solutions, where we combine classic management consulting with outstanding technological expertise. For more than 9 years, we have been supporting companies around, through various consulting services to improve the sustainability of their competitiveness and performance capabilities along the entire value chain with the aid of innovative technologies.

## Vision

Phans4 consulting private limited is a global diversified company with a network of workforce committed to the growth of your business through innovation which strikes for a sustainable development of your business.

## Areas We Do Consulting

Phans4 consulting services are carried out in areas like water resources, irrigation schemes, micro irrigation, rural water supply and sanitation, effluent treatment plants, sewage & sewerage treatment, storm water drainage system, lake development.



# OUR SERVICES

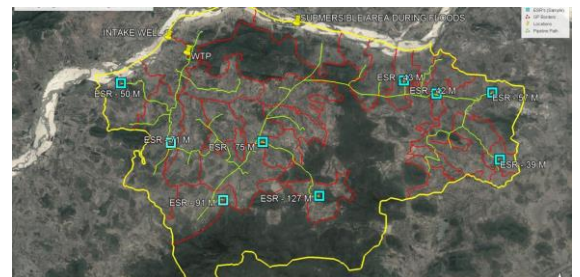
## 1. RURAL WATER SUPPLY SCHEMES (RWSS)

Population growth in India is putting tremendous pressure on existing water systems to supply water to both urban and rural area in terms of quality and quantity requirement.

**PHANS4 CONSULTING** has designed efficient rural piped water supply consulting solutions to meet the requirements of the country. Our experienced Engineers draws a lot of strategies and best technologies to the projects.

### OUR SERVICES INCLUDE

- ◆ Water demand studies,
- ◆ Site survey and investigations
- ◆ Reservoir studies,
- ◆ Raw water intake pump calculations,
- ◆ Master balancing reservoir (MBR),
- ◆ Water treatment plant design, Capacity calculations,
- ◆ Elevated service reservoirs,
- ◆ Distribution pipeline networks and hydraulics.
- ◆ Our expertise also includes smart water grid design with SCADA systems.

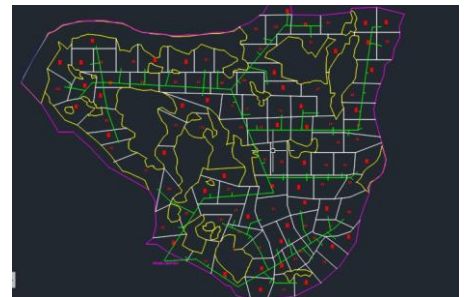
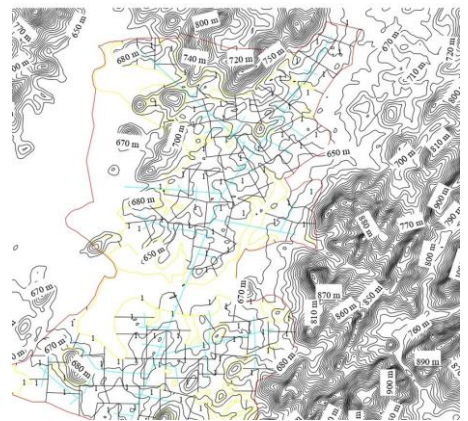


## 2. LIFT IRRIGATION SCHEME

Lift irrigation schemes are instrumental in stabilizing agricultural production in the years of drought and increase food production. For successful functioning the LIS requires appropriate techniques, planning, designing, execution under technical guidelines, understanding the importance **PHANS4 CONSULTING** has proven expertise in all types of lift irrigation consulting projects with integrated and customized service to clients in the field of irrigation.

### OUR SERVICES INCLUDE

- ◆ Tender Support (Pre-bid Review, Meetings, Queries, Bid submissions) GIS
- ◆ Mapping
- ◆ Survey and Investigations Intake systems,
- ◆ Pump House design and selection,
- ◆ Rising Mains/Pressure Mains (DI, MS Pipes)
- ◆ Gravity mains (DI, MS pipes, HDPE),
- ◆ Delivery Chamber/BPT
- ◆ Distribution network planning,
- ◆ Control and Instrumentation design of entire scheme,
- ◆ Major and Minor outlets with Locations,
- ◆ Bill of Quantities,
- ◆ Project management consulting.



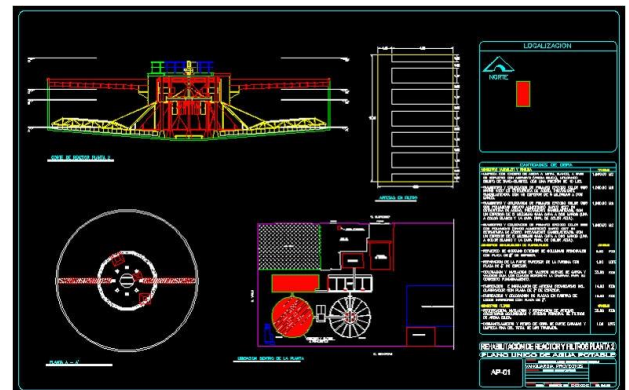


### 3. WATER AND EFFLUENT TREATMENT PLANT

PHANS4 CONSULTING engineers has proven experience and independent consultancy on water and waste water treatment in enhancing the efficiency of the plant while adding extra safety to the environment. **PHANS4 CONSULTING** has focused in improving operational flexibility and reliability mastered the design and development of efficient systems for industrial water treatment and effluent treatment plants.

#### OUR SERVICES INCLUDE

- ◆ Site Study & Design engineering,
- ◆ Technologies involved,
- ◆ Preparation of feasibility study (WTP, ETP),
- ◆ Detailed project reports (WTP, ETP),
- ◆ Transaction advisory services (WTP, ETP),
- ◆ Source,
- ◆ Water quality report (pH, TDS, TSS, Hardness, Cl, SO<sub>4</sub>, Turbidity, COD)
- ◆ Design and Supply and Erection and Commissioning
- ◆ Operations and Maintenance (WTP, ETP).

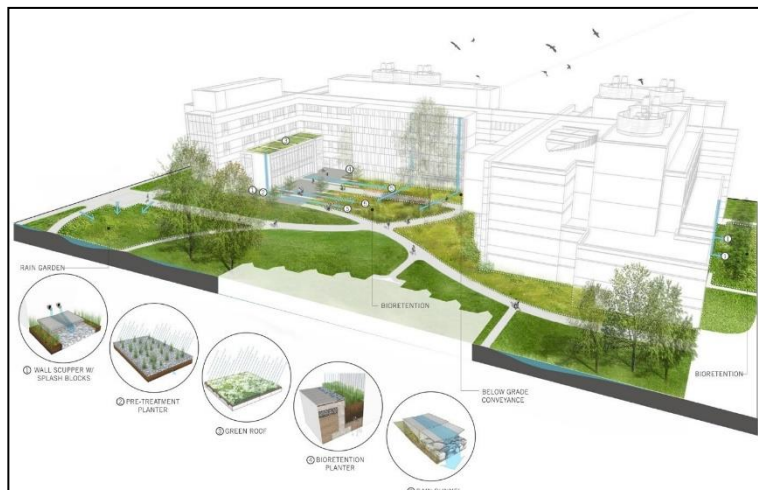
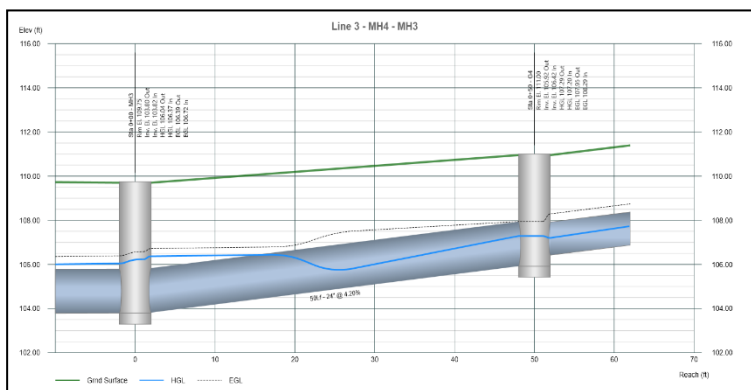


## 4. STORM WATER DRAINAGE SYSTEM

Storm water management is the effort to reduce the run off of rainwater and improvement of water quality. Together we provide a greater understanding of the characteristics of storm water run-off, sediment detention design, water quality impacts and management of non-storm water potential pollutant sources. Over the years **PHANS4 CONSULTING** has developed design models for efficient storm water drainage systems for various government bodies, SEZ's, Real-estate projects, ports across India.

### OUR SERVICES INCLUDES

- Identifying the urban flooded areas using latest technologies,
- Data collections,
- Conducting surveys and investigations.
- Preparation of storm water drainage network,
- Hydraulic designs of storm water drainage locations like inlet locations, Manholes,
- Pumping of storm runoffs,
- Outfall structures and natural streams
- Conducting rainfall analysis,
- Design of rain water harvesting systems.



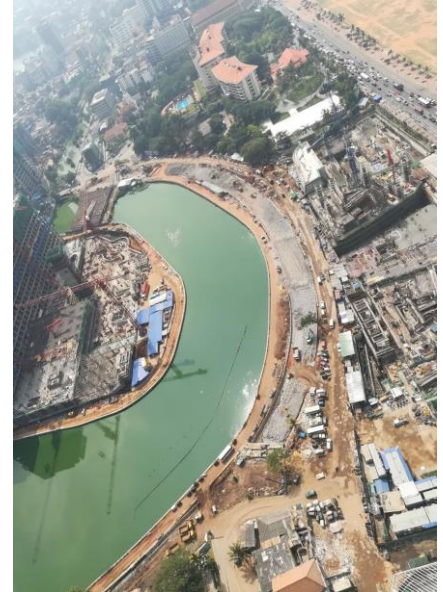


## 5. LAKE DEVELOPMENT

Lake development consulting is considered the one of the finest expertise for PHANS4 Consulting, as we have mastered the design, execution and operations and maintenance of lake development and lake rejuvenation.

### OUR SERVICES INCLUDE

- Detailed project report for Strengthening and Beautification of Micro Irrigation and ZP Tanks,
- Bund improvements & Pitching work,
- Gravity main pipeline network,
- Topographical survey maps of the area Village map, tank details,
- Rainfall details,
- Reconnaissance survey for tank silt,
- Bund details & Waste weir details,
- Preparation of preliminary designs,
- Drawings & detail estimates required for the desilting,
- Improvements of tank, waste weir, etc., and structures detail design,
- Estimates and drawings,
- Detailed alignment survey,
- Detailed Engineering,
- Drawings for Gravity main pipe including structures coming across,
- Pipe diameter,
- Structures including hydraulic particular.

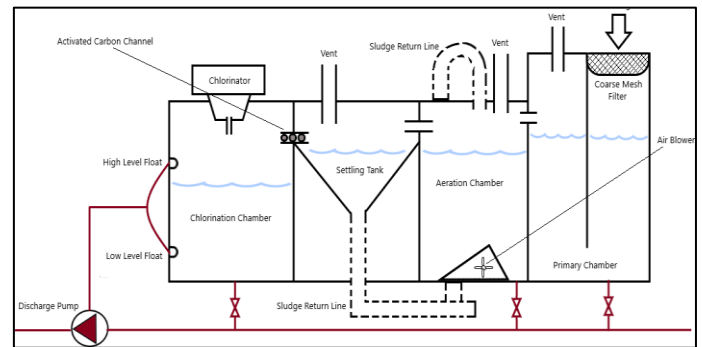


## 6. SEWAGE AND SEWERAGE TREATMENT

PHANS4 CONSULTING has immense experience in Sewage Treatment Plants consulting for cities and townships, municipal organizations and private sectors through the design, engineering, and commissioning of Sewage Treatment Plants. Our treatment plants are developed on the basis of our client's requirement as Phans4 consulting has mastered the engineering design for sewerage treatment systems over the years.

### OUR SERVICES INCULDE

- Develop forecasting models for estimation of sanitary sewage,
- Hydraulics of sewer,
- Design of sewer systems, Layouts,
- Components of the system, Sizing,
- Design and selection of sewer appurtenances,
- Suggesting the material for construction of sewers,
- Structural design of sewer.





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## END OF THE DOCUMENT

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