

Windmill for Water Pumping

DESIGNED AND INSTALLED BY LOCAL GOVERNMENT ENGINEERING DEPARTMENT (LGED), BANGLADESH

Introduction:

- Low cost
- Local manufacture
- Minimal maintenance
- 20,000 of water per day at 4.0 m/s wind velocity
- 10 m head

Technical Data :

- Rotor dia 2.75m
- No of blades 24
- Starting wind speed 1.8 m/s
- Pump type semi rotor reciprocating suction pump
- Output 20,000 liters/day, 10m head at 4.0m/s wind velocity

Use of Windpump :

- Villages
- Schools
- Rural Clinics
- Farms (irrigation & Livestock)
- Small scale industries
- Nature/Wildlife reserves
- Land Drainage
- Salt Production
- Waste water treatment
- Aerations



Wind Data :

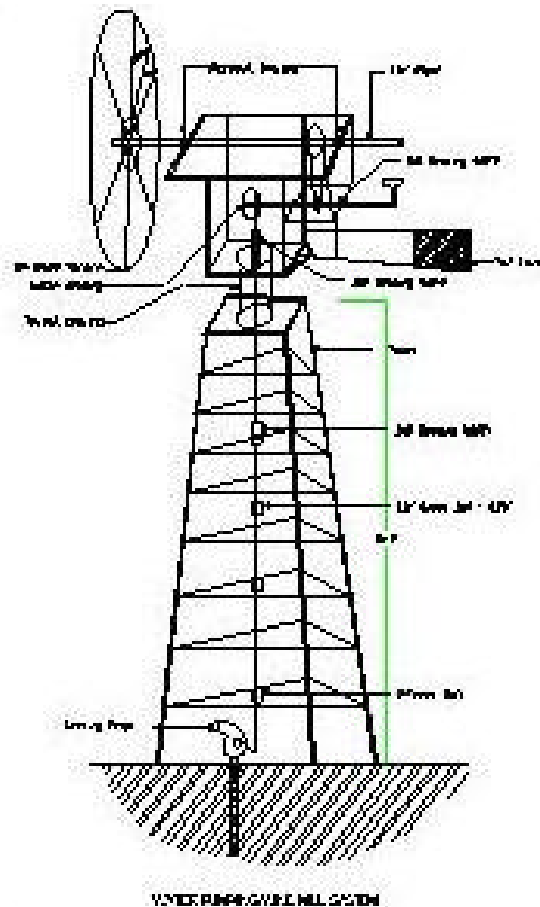
PLACE	AVG. WIND SPEED (M/S)	SENSOR HEIGHT (M)	DATA ACQUISITION PERIOD
Kuakata	4.54	25	96-97
Kutubdia	4.18	25	96-97
Char Fasson	3.28 4.07	10 25	96-97

			96-97
Patenga	3.84	25	96-97
Cox's Bazaar	3.34	25	96-97
Noakhalil	2.96	25	96-97
Teknaf	2.96	25	96-97

Basic concept of windpump :

- Wind energy is converted into rotary mechanical motion of wind turbine
- Rotary motion of the wind turbine is converted into reciprocating motion
- The reciprocating motion is used to operate a reciprocating suction pump
- The pump sucks water and delivers into storage tank

- The Well
- The Wheel or Rotor
- The Transmission Linkages
- The Tail
- The Turbine
- The Pump
- The Pump Rod Assembly
- Bearings
- Tower
- Storage Tank



DIFFERENT PARTS OF WIND PUMP SYSTEM

Materials & Manufacture :

- Most of the materials is steel angle sections, steel plates, chains with sprocket, G.I. Sheet etc.
- Few ball bearings and guides are required
- Little machining is required
- Few turning ,boring ,drilling and welding

Installation and Maintenance :

- Total weight of machine including the tower is under 800 kg
- Easy and safe installation using chain pulley mechanism and sometimes using a winch
- Maintenance is limited to greasing the ball bearings once a year
- Touching up or repainting every few year
- Servicing of pump (change seals only) every few years

Advantages :

- Low cost
- Low maintenance cost
- No fuel cost
- Minimal maintenance
- No pollution
- Ergonomic design

Conclusion :

- Proved functional to supply water in rural areas
- Should be disseminated in our country to meet the need of water to the rural people
- Design should be updated applying special thrust by observing its performance