

# *Bhavnagar City Water Supply Scheme*

*developed under BNVY-MM SJSY*



## *Bhavnagar Municipal Corporation*

Bhavnagar was an independent state ruled by Krishnakumar Sinhji who handed it over to the Bombay State in 1948 & became the First King of India to give up his state to the Union of India.

It is a coastal city on the eastern coast of Saurashtra & occupies an area of 53.3 km<sup>2</sup>.

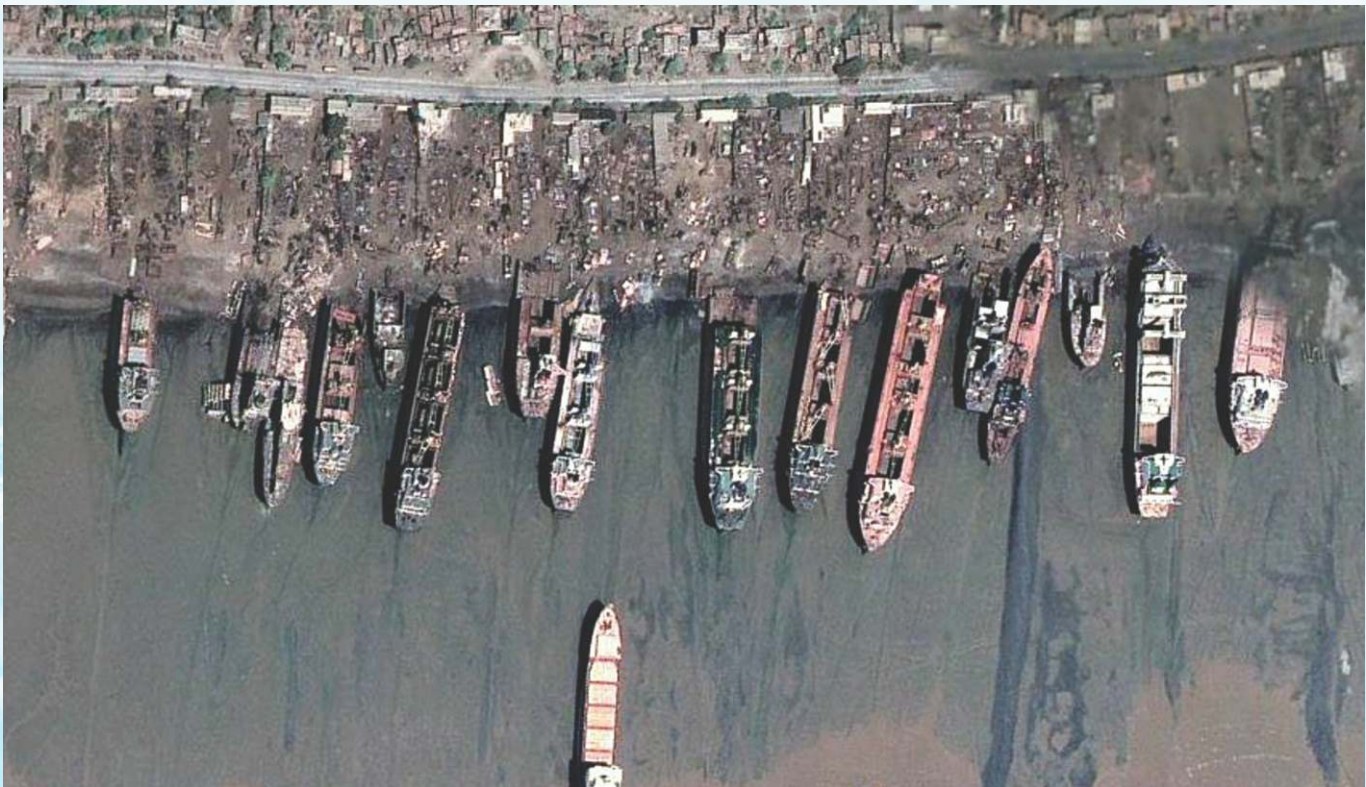






Bhavnagar is the largest producer of **salt**, with 34,500 MT being produced annually in the district.

Bhavnagar had trade links with Southeast Asia, Africa, Arabia and ports of Red Sea since the early 18th century. **Nilambag Palace (1894)**, now a heritage hotel, is set amidst a huge estate of 10 acres; was designed by a British architect, William Emerson.



The **Alang** ship breaking yard is the biggest in the world, recycling about **50%** of the salvaged **ships of the world**. This has also helped develop supporting industries, such as oxygen bottling plants, re-rolling mills, and induction furnaces. Bhavnagar manufactures fiberglass reinforced plastic (*FRP*) boats and steel vessels at the **shipbuilding** facility of **Alcock Ashdown (Gujarat) Ltd.**



## Situation :

The rapid growth of the city & poor water storage (given its proximity to Sea & surrounding Salt pans); Bhavnagar was facing **severe water shortage** between 1990's to 2013.

### Prior to 2013

#### Source of Raw Water :

- 1) Gaurishankar : 20 MLD
- 2) GWIL : 40 MLD
- 3) Khodiyar : 7 MLD



### After 2013

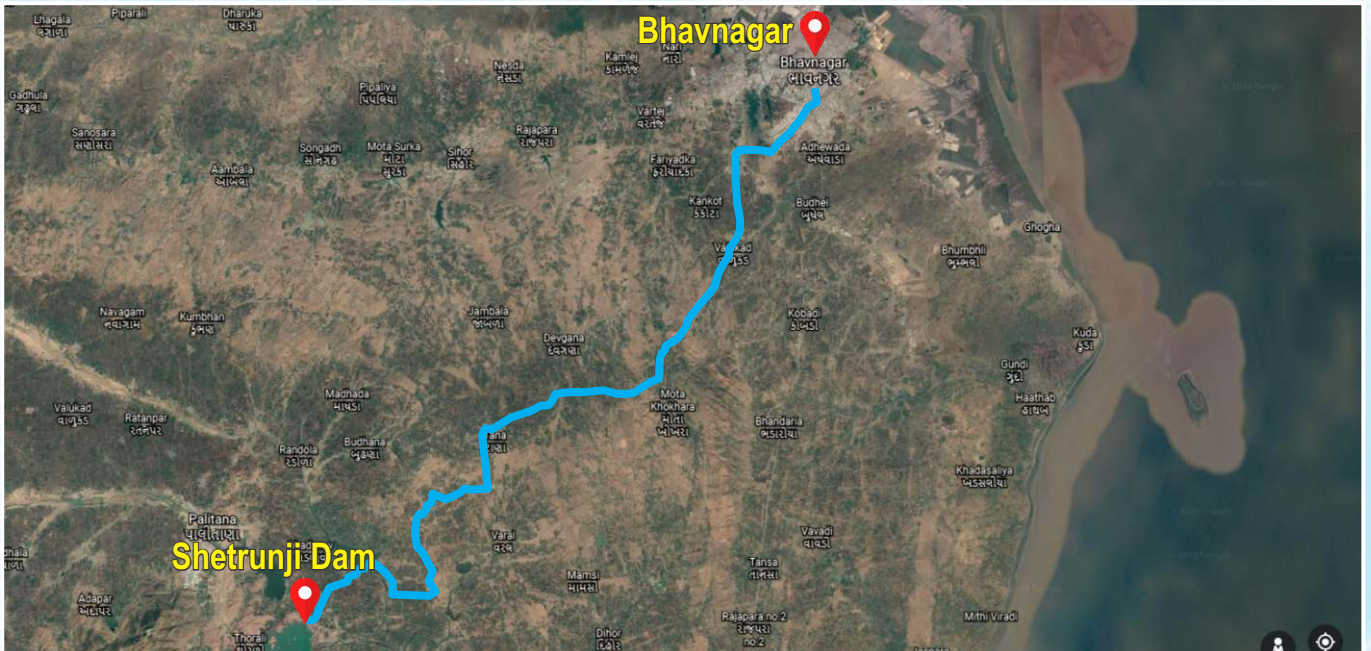
#### Source of Raw Water :

- 1) **Shetrunji Dam** : **100 MLD by Pumping**
- 2) Gaurishankar : 20 MLD by Gravity
- 3) GWIL : 40 MLD by Gravity
- 4) Khodiyar : 7 MLD by Gravity

Hence to mitigate the water scarcity a Mammoth & Comprehensive **upgradation of WSS** was planned under BNVY-MM SJSY funding. BMC planned to source 100mld raw water from almost 57km away & at a high head - from Shetrunji dam near Palitana foothills.

This would boost the water availability **from 67mld to 167mld..!**

To distribute this additional water, New Clear Water Distribution Pumping Stations (CWDS) at **Diamond Square & Neelambaug** were also executed. **Aqua's SubCF pumps** were selected for all the projects.





# Solution : Shetrunji 100 mld Offtake



The Palitana dam was built in 1959 across the river at Nani-Rajasthali and represents Shetrunji's irrigation scheme meant to provide cultivation to an area of 56,000–86,000 acres.

It's course begins east-northeast along an alignment which runs parallel to the Narmada Fault, passes north of Palitana's hills, Shatrunjaya, then in a southeasterly direction past Talaja Hill, through a peninsula, before reaching the Gulf of Cambay, approximately 6 miles (9.7 km) north of Goapnath Point.



**BMC Shetrunji Offtake**

ગુજરાત પાણી પુરવઠા અને ગટર વ્યવસ્થા બોર્ડ માંખીનગર

પાલનગર શહેરની પુરક પાણી પુરવઠા યોજના તળે સેન્ટ્રલ ડેમસાઈટથી દાણા બો.પી. ડી. સુધીની ૧૨૦૦ મીટીર બાલકની ૧૭.૦૦ ડી.પી. લંબાઈની માઉન્ટેડ સ્ટીલ સહજીવ પેઇપ ૩૭ ક્રોડના અર્થે નેપથર થયેલ પાઈપલાઈનના કામ લોકાર્પણ

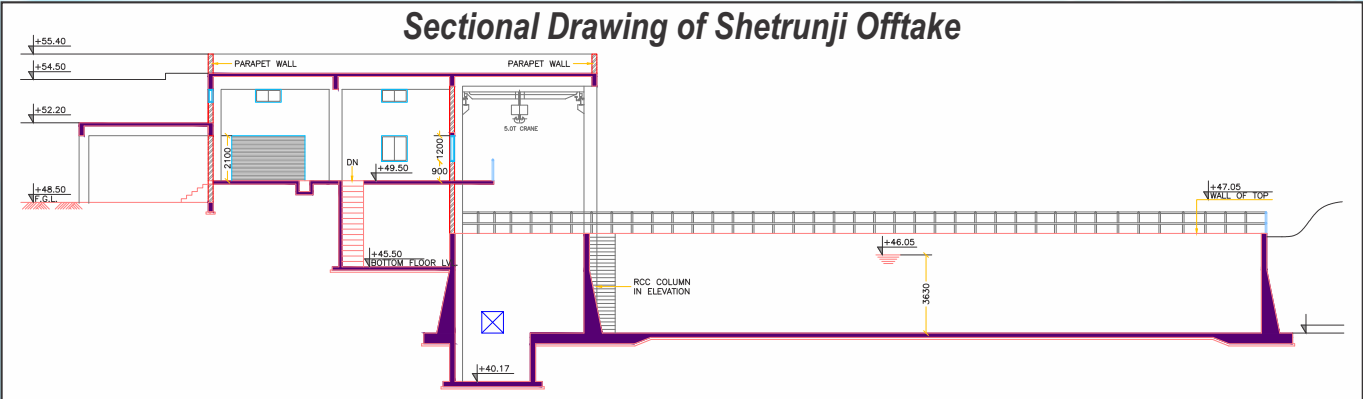
**શ્રી બાબુભાઈ બોખીરીયા**  
માનનીય મંત્રીશ્રી, પાણી પુરવઠા, જમસંપત્તિ (કંપનર પ્રધાન વિભાગ) ના વરદ હસ્તે  
તા. ૭. ૩. ૨૦૧૩ ને ગુરુવારના રોજ કરવામાં આવેલ છે.  
મહેશભાઈ જી.કે. સમયાલિય

ભાવનગર મહાનગરપાલિકા

સ્વલિંબ જથ્થેતિ મુખ્યમંત્રી શહેરી વિકાસ યોજના અંતર્ગત સેન્ટ્રલ ડેમ સાઈટ પર કુ. ૧૧ કરોડના ખર્ચથી નવનિર્મિત કેનાલ બેઈઝડ પંચપીંગ સ્ટેશનનું લોકાર્પણ

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અ. એન. રેલ (૧૧૧) મહેશભાઈ બો. અમરજી મીસર. મુકેશભાઈ મોહી. ડિવિડન. શોભેન. વેદાનકાર ત્રિવે. મેહર. શાનિવ ત્રિવે. રેલકો.

**Sectional Drawing of Shetrunji Offtake**







**Shetrunji Dam Pumping Station has a 5 ML Raw Water Sump & 6 nos. of SubCF pumpsets .**

**Aqua Submerged Centrifugal Pumpsets**

- Capacity : 1042 m<sup>3</sup>/hr
- Head : 97 m
- kW / HP : 410 / 550
- Qty : 6 Nos.
- Installation : Autocoupling System
- Installed In : Raw Water Intake
- Running From : August 2013



સીટીએન્જીનીયર કચેરી  
ભાવનગર મહાનગરપાલિકાની કચેરી, બીજો માળ,  
સર મંગળ સિંહજી રોડ, ભાવનગર.  
Phone : (0278)2511605 Email : city.bmc@gmail.com

Date: 23/09/2016

**CERTIFICATE**

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that since Aug-2013, we are using 6 no's of 1042 m<sup>3</sup>/hr and 97m head, 550 hp "AQUA" make submerged CF pump set at our Shetrunji PS for Raw Water Intake for Bhavnagar Municipal Corporation.

These pumps are running continuously 22-24 hours in very highly turbid water. Based on our usage of 3 years; we have found the overall performance of the pump sets are found satisfactorily.



*Shankar*  
City Engineer  
Municipal Corporation  
Bhavnagar



# Neelambaug CWDS



- ### Aqua Submerged Centrifugal Pumpsets
- Capacity : 650 m<sup>3</sup>/hr
  - Head : 37 m
  - kW / HP : 90 / 120
  - Qty : 6 Nos.
  - Installation : Autocoupling System
  - Installed In : CWR
  - Running From : January 2014



**BHAVNAGAR MUNICIPAL CORPORATION** ભાવનગર મહાનગરપાલિકા

Date: 10<sup>th</sup> march, 2017

## To Whom So Ever It May Concern

This is to Certify that since Jan 2014, we are using Aqua make Submerged Centrifugal pumpsets (650 m<sup>3</sup>/hr x 37 m @ 120 hp 4W+ 2S) at our Neelambaug Clear Water Distribution PS.

These pumps were supplied, erected, operated & maintained by EPC Contractor. They have run daily & have worked well in the year defect liability period.

Based on our satisfactory experience of till date, we recommend the use of Aqua make robust Submerged Centrifugal pumpsets for Water distribution applications

*Shardarona*  
City Engineer  
Bhavnagar Municipal Corporation  
Bhavnagar





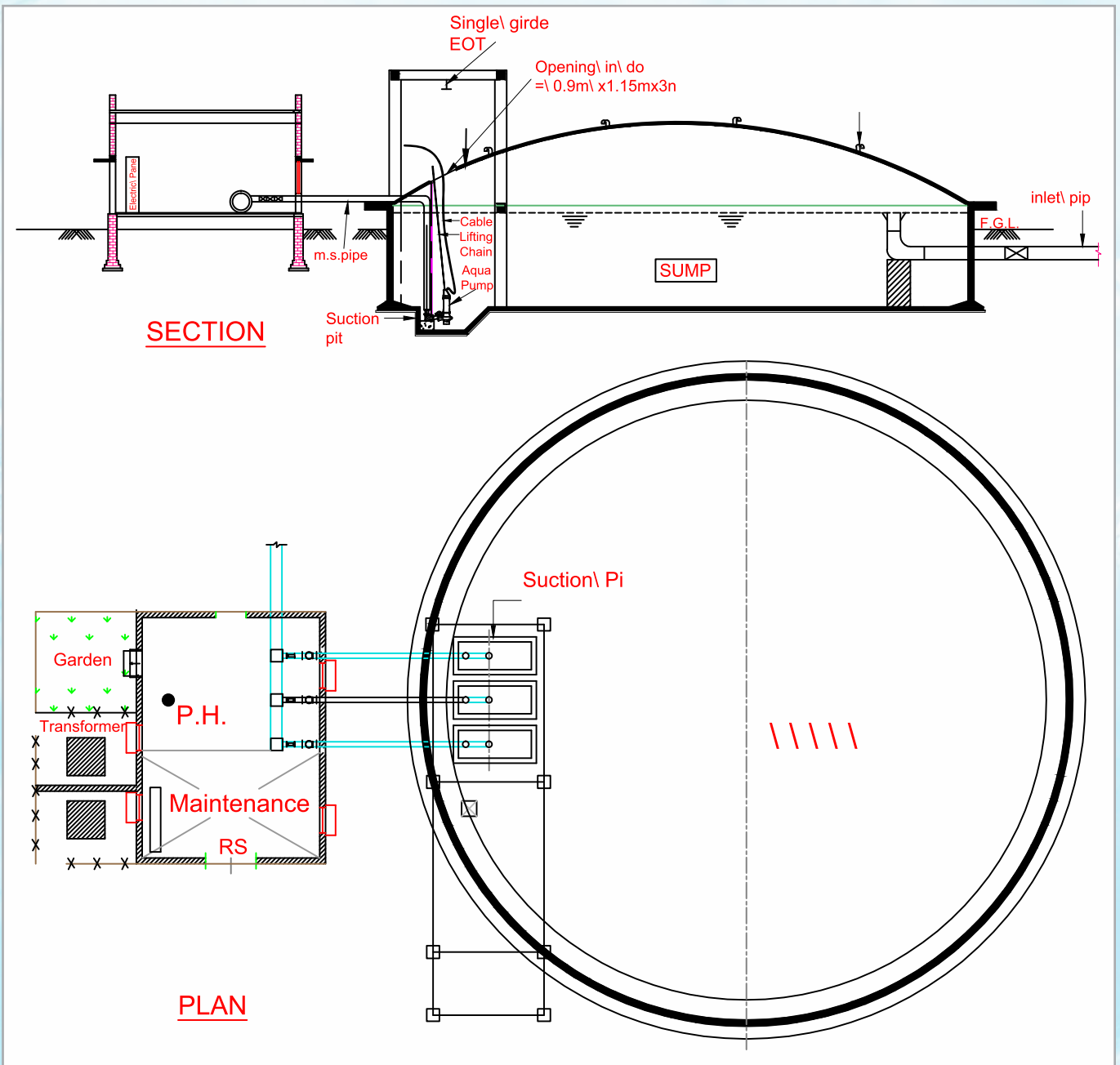
# Diamond Square CWDS



The use of SubCF eliminated Pump Room (mandatory for HSCF pumps) **saved a lot of space** which was used to make a larger clear water reservoir.

## Aqua Submerged Centrifugal Pumpsets

- Capacity : 650 m<sup>3</sup>/hr
- Head : 37 m
- kW / HP : 90 / 120
- Qty : 3 Nos.
- Installation : Autocoupling System
- Installed In : CWR
- Running From : January 2014





### Substantial Savings

Reduction in Pump House Space, Construction cost & Suction piping Manifold complexity.



### Maintenance Free

Requires No Consumables or Routine maintenance, like :

- Oiling,
- Greasing,
- Gland Rope Tightening & Replacement,
- Shaft Sleeve Replacement
- Shaft Alignment,
- Dewatering of Gland / Leakage or Seepage into the Dry Pump room etc.



### Robust & Reliable

Over-safe Design & Smart Protection Systems result in high Reliability.



### User Friendly

- No risk of cavitations.
- No damage due to Flood or Rains.
- No Priming.
- No Alignment.



### Low Energy Cost

Due to Elimination of Suction Losses, Coupling Losses & Auxillaries; Wire to Water efficiency is slightly better than HSCF pumps.

*"We are using many Aqua Submerged Centrifugal pumpsets for Clear us well as Raw water Intake - infact almost 100% of pumped (which is 71% (of our Total) Raw Water is via Aqua's Submerged CF pumpsets.*

*Apart from satisfactory pumpset performance over the years; Aqua has also extended courteous & competent Engineering Support & After Sales Services to BMC in trouble shooting minor troubles related to Electricals, VFDs, etc (in the greater interest of WSS). We recommend Aqua brand & the use of Submerged CF pumps for critical water supply applications"*

**- S. J. Chandarana,**  
City Engineer, B.M.C.

## Aqua Machineries Private Limited

[www.aquapumps.com](http://www.aquapumps.com)

Registered Office & Manufacturing Plant

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