



## Contents of Detail Design Report for Water supply system.

### 1. Description of the Island

### 2. Existing water supply and sanitation system

- 2.1 Current Water Supply sources
  - 2.1.1 Plastic Water Tanks (HDPE Tanks)
  - 2.1.2 Ground Water Wells
- 2.2 Existing Sanitation System

### 3. Drinking Water Usage

- 3.1 Drinking water usage
  - 3.1.1 Present water Usage
  - 3.1.2 Future water Usage

### 4. Protected areas, Zones and Reserves (if applicable)

### 5. Consultation with the Community

### 6. Design of Water supply system

- 6.1 Introduction
    - a) Supply and Distribution of Drinking Water through RO System.
    - b) Supply of Drinking water through Rain Water Harvesting system
    - c) Energy Integration by Using Solar Power (PV system integration)
  - 6.2 Supply and distribution of safe water through Water Supply System
    - 6.2.1 Design Considerations
    - 6.2.2 General Considerations for Water Network design
    - 6.2.3 Source of Water
    - 6.2.4 Pretreatment of raw water
    - 6.2.5 Reverse Osmosis Filtration
    - 6.2.6 Degasification of product water
    - 6.2.7 Post treatment & Water storage
    - 6.2.8 Water Distribution System
    - 6.2.9 Household Connections & Water Meters
    - 6.2.10 Brine Disposal
    - 6.2.11 Administration Building
    - 6.2.12 Excavation & Backfilling
    - 6.2.13 Control Cabinets and Panels
    - 6.2.14 Pumps
  - 6.3 Rainwater Harvesting System
    - 6.3.1 Collection of Rain water from Institutional Roofs
    - 6.3.2 Rain water collection Network
    - 6.3.3 Collection of rainwater before treatment
    - 6.3.4 Rainwater treatment (UF treatment)
    - 6.3.5 Post treatment of rainwater
  - 6.4 Environment Friendly technology for water supply system
- ### 7. Renewable energy Integration (PV system integration)
- ### 8. Design criteria's & calculations
- 8.1 Rainwater harvesting system
    - 8.1.1 Roof Area for Rainwater Harvesting
    - 8.1.2 Rainwater to RO water integration
    - 8.1.3 Rainwater Harvesting & Rainwater Tank Capacity Calculations

- 8.1.4 Rainwater Network Pipe Sizing & First Flush Device Sizing Details
- 8.2 RO system design calculation
  - 8.2.1 RO plant capacity calculations
  - 8.2.2 Choosing RO membrane and storage tank
  - 8.2.3 Water CAD Analysis / EPANET
    - a) Closed loop analysis
    - b) Network pressure analysis
    - c) Network headloss analysis
    - d) Pipe and valve criticality analysis
    - e) Flushing simulations
    - f) Pump analysis
  - 8.2.4 RO Plants & Water Storage Tanks Sizing Calculations
  - 8.2.4 Degasifier sizing calculations
  - 8.2.5 Pump sizing calculations
    - 8.2.5.1 Borehole Feed Pump Sizing
    - 8.2.5.2 Distribution Pump Sizing
  - 8.2.6 Electrical Load Calculations for IWR system
  - 8.2.7 Anchor Block Size Calculations
  - 8.2.8 Brine Outfall Diffuser
- 8.3 Solar power (pv) integrations
  - 8.3.1 Solar Power from PV Modules
- 9. Estimated Energy Demand for the System**
- 10. Provision of Standby Electricity**
- 11. Estimated Operational cost**
- 12. Spares & Maintenance Tools**
- 13. Conclusion**
- 14. Annexes**
  - 14.1 Approved Concept Design Report (ANNEX-01)
  - 14.2 Approved Topographic survey report (ANNEX-02)
  - 14.3 Rainwater Network Pipe Sizing Calculations and First Flush Device size calculations (ANNEX-03)
  - 14.4 Water Network Demand Calculations (ANNEX-04)
  - 14.5 Water cad simulation report (Annex-05)
  - 14.6 RO plant Capacity Calculations (ANNEX-06)
  - 14.7 Degasifier Sizing Calculations (ANNEX-07)
  - 14.8 Load Calculations for IWR system (ANNEX-08)
  - 14.9 Anchor Block Sizing Calculations (ANNEX-09)
  - 14.10 Spares and Maintenance Tools list (ANNEX-10)
- 15. Appendix**
  - 15.1 Location Approval Letter
  - 15.2 Civil Structural Stamped drawings, PNID/ SLD stamped Drawings
  - 15.3 Concept Design Approval Letter / Mail
  - 15.4 EIA Decision Statement
  - 15.5 Rated BOQ
  - 15.6 O&M Training Outline
  - 15.7 Laboratory Equipment List
  - 15.8 Power assurance letter from Utility Service Provider
  - 15.9 Construction Methodologies
  - 15.10 Catalogues and brochures

## **Contents of detail drawings report for Water supply system.**

### **DESIGN LAYOUT**

1. Water Supply Network Layout
2. Water Supply Network Zone Layout
3. Water Supply Network Layout - Zone 01, Zone 02 .....
4. Network pressure layout (WaterCAD/ EPANET)
5. Network Headloss layout (WaterCAD/ EPANET)
6. Rainwater Collection Network Layout
7. E&M Drawings.

### **DETAILED DRAWINGS FOR SPECIFIC COMPONENTS**

1. House, commercial and institutions connection details
2. Valve chamber details
3. Water meter layout
4. P&DI diagram of the RO plant.
5. E&M Drawings for control panel
6. Trenching layout
7. Borehole details
8. Brine tank details
9. Rainwater lift well details
10. Pump shed details
11. Pump shed structural details
12. Treated water tank details
13. Rainwater holding tank details
14. Rainwater transfer pump hut layout
15. Ballast block details
16. Diffuser details
17. Brine sea outfall details
18. Rainwater first flush details
19. Rainwater Internal network layout
20. Washout valve chamber detail
21. Soak pit details
22. Administrative (RO) building facility layout
23. Boundary wall layout