

DESIGN OF PROPOSED WATER SUPPLY SCHEME

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Abstract - Water is a valuable resource, used as the main raw material by our civilization. Approximate 68% population of India is staying in the rural area (census 2011, India). This project demonstrates the design of rural water distribution system for a area located in the rural region. For this study, water supply distribution network is designed for population estimated for future 15 years. The software WATER CAD has been used for designing best economical water distribution system. continuous water supply planned for the study area considering 12640/d water consumption. in water distribution network, study of present population, daily water demand, flow and also survey of village pottikunnu was done with the help of Dumpy Level. From the Level survey, map was created and also elevation and length of Pipe line required for the village was calculated. The node no. and pipe no. was denoted on map of villages. Water Distribution Network of village was designed with the software and compared with manually result. It was found that software result were more accurate, save time and manpower than manual result. The economical diameter of water supply distribution system is designed by considering the constraint such as residual nodal pressure, velocity of flow in pipe, pipe material, reservoir level, peak factor and available commercial pipe diameters etc. The water supply distribution system is designed for the rural area pottikunnu village in malappuram.

1. INTRODUCTION

Water distribution system, a hydraulic infrastructure consisting of elements such as pipes, tanks, reservoirs, pumps and valve etc., is crucial to provide water to the consumers. Effective water supply system is of paramount importance in designing a new water distribution network or expanding the existing one. Pipe water system is one of the best systems to supply water safely, adequately and continuously. To supply adequate, safe and continuous water in rural areas, regional water supply schemes are formed in which more than one village are served from a common water source through pipe system. Distribution networks are also an essential part of all water supply systems. Distribution system costs within any water supply scheme may be equal to or greater than 60 % of the entire cost of the project. Design and analysis of pipe networks are important, because availability of water is an important economical development parameter. Water is a valuable resource, used as the main raw material by our civilization. Approximate 68% population of India is staying in the rural area (census 2011, India). This project demonstrates the design of rural

water distribution system for a area located in the rural region. For this study, water supply distribution network is designed for population estimated for future 15 years. The software WATER CAD has been used for designing best economical water distribution system. continuous water supply planned for the study area considering 12640/d water consumption. in water distribution network, study of present population, daily water demand, flow and also survey of village pottikunnu was done with the help of Dumpy Level. From the Level survey, map was created and also elevation and length of Pipe line required for the village was calculated. The node no. and pipe no. was denoted on map of villages. Water Distribution Network of village was designed with the software and compared with manually result. It was found that software result were more accurate, save time and manpower than manual result. The economical diameter of water supply distribution system is designed by considering the constraint such as residual nodal pressure, velocity of flow in pipe, pipe material, reservoir level, peak factor and available commercial pipe diameters etc. The water supply distribution system is designed for the rural area pottikunnu village in Malappuram.

1.1 Objectives

The main objective of the study was to propose a water supply scheme for the above mentioned project of 23 houses. Other works included finding out possible location of sources of water in the area, testing of the water quality, comparison of those values with standards specified by the government. Proposal of water treatment technologies depending upon the results of water quality tests carried out in the whole area. Water quantity estimation, population estimation, design of intake structures, and pumping apparatus, mode of conveyance of water, Water Storage structures and finally water supply network (water distribution network).

1.2 Scope of the work

The area pottikunnu hill region there have lot of households facing water scarcity in there Trough out of year the scarcity of water is one of the main problem. Currently There have no any fresh water sources. there Have an existing pond / reservoir but the water is not fit for drinking purpose and other domestic purposes. so conduct a water supply scheme in that region with ensuring the quality of water by implementing proper water treatment method.

2. PREVIOUS RESEARCH

Mallikarjun S.K, Jyothi D.O., Manjureddy K.H, Sandhya H.B, Anand.S. Amaravati studied about the design of water supply scheme for wss houses in agra, uthsar pradesh, india Ensuring maximum quality of water and distribution of water in rural areas in the International Journal of Science, Environment and Technology, Vol. 2, No 2, 2013, 211 – 229. From this journal we obtain certain datas for the safe design of water treatment scheme for the area in order to supply the treated water to the houses. Vidhi N. Mehta¹ And Dr. G. S. Joshi studied about Design Of Rural Water Supply System Using Loop 4.0, our software is water cad hence we cannot adopt all design procedure in this project but we use some safety considerations from that journal named International Journal of Modern Trends in Engineering and Research (IJMTER).

Dr.Sohail ayub And **Adithya kumar** (2013) studied about Design of 24x7 Water Supply System for Ranebennur Town. The project highlights the work carried out on the population forecast, water requirement and water supply to the Ranebennur town, Haveri district, Karnataka, -India. The Current project has been carried out on design a 24x7 water supply scheme for a Ranebennur town for domestic use.

V. N. Mehta and **Joshi G.S** demonstrates the design of rural water distribution system for a area located in the rural region. For this study, water supply distribution network is designed for population estimated for future 30 years. The heuristic software BRANCH version 3.0 has been used for designing best economical water distribution system. Intermittent water supply planned for the study area considering 100 lpcd water consumption.

Vidhi N.Mehta and **Dr.G.S. Joshi** concerns for the design of rural water distribution system in developing countries. Approximate 68% population of India is staying in the rural area (census 2011, India). For this study, water supply distribution system is designed for population estimated for future 30 years. The heuristic software LOOP version 4.0 has been used for designing best economical water distribution system.

3. MATERIALS AND METHODOLOGY

3.1 Materials

- Questionnaire analysis report.
- Population data from panchayath.
- Rough sketch of region.
- Water samples and water quality test result.
- Node diagram obtaining from leveling survey.
- Result from water cad

3.2 Methodology

Community survey and engineering survey are the most important part in a designing of q water supply system

through the cummunity survey the data collected from households and also feasibility and preliminary survey carried out.



Fig.1 Community survey

Through the engineering survey the water quality test and method of treatment is determind and through leveling survey , map and node prepared on basis of engineering survey.



Fig.2 Engineering survey

The designing of water supply system completed by using water CAD software , and prepared estimation of project and detailed scheme report.

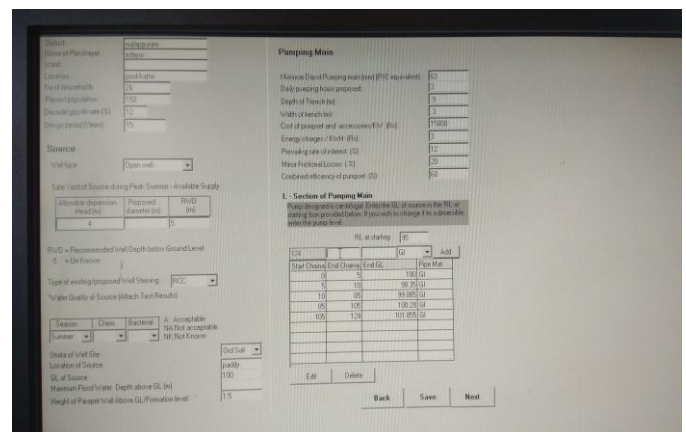


Fig.3 Water CAD software

4. RESULTS AND DISCUSSION

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By conducting community survey and engineering survey all related datas are collected and by using the water CAD software the scheme is successfully completed.

5. CONCLUSION

In this work, the water distribution system has been design with the help of WATER CAD in which we use number of nodes, elevation, number of pipes and demands of POTTIKUNNU area. First we surveyed the area and take information about the population and per capita demand of the people. And according to that we design the distribution system for the area. In this system centrifugal pump used having power of 3hp. In storage two overhead tanks are used having capacity of 6230 liters.

Here during the day time hours that is peak hours during morning time the demand of water is more as compared to the other time so the maximum supply is given for 8 hours a day. And also we concluded from the graphs that we obtained from WATER CAD shows that the demand is more during the peak hours.

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