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CAUVERY NIRAVARY NIGAMA NIYAMITHA
(GOVERNMENT OF KARNATAKA UNDERTAKING)
WATER RESOURCES DEPARTMENT
IRRIGATION (SOUTH) ZONE, MYSORE



REPORT, DESIGNS & ESTIMATES

**Construction of Diversion Weir and Channel
for Byramangala Reservoir of Ramanagara
Taluk, Ramanagara District**

COST Rs. 110.00 Crores

INd. 25274

EXECUTIVE ENGINEER
MANCHANABELE PROJECT DIVISION
CAUVERY NIRAVARY NIGAMA NIYAMITHA
RAMANAGARA



JALAVAHINI MANAGEMENT SERVICES PRIVATE LIMITED, BANGALORE, 080-2314 2144, 2314 8024.

Construction of Diversion Weir and Channel for Byramangala Reservoir of Ramanagara Taluk, Ramanagara District

GENERAL REPORT

Introduction

Reservoirs and lakes occupy a prominent place in the history of irrigation in South India. Lakes are useful life saving mechanism in the water scarcity areas which are categorized as Arid and Semi-arid zones. The lakes and reservoirs, all over the country without exception, are in varying degrees of environmental degradation. The degradation is due to encroachments, eutrophication and siltation. There has been a quantum jump in population during the last century without corresponding expansion of civic facilities resulting in deterioration of lakes and reservoirs, especially in urban and semi urban areas becoming sinks for the contaminants. The degradation of reservoir and lake catchments due to deforestation, stone quarrying, sand mining, extensive agricultural use, consequent erosion and increased silt flows have vitiated the quality of water stored in the reservoirs. Different problems of the lake include excessive influx of sediments from the lake catchment, discharge of untreated or partially treated sewage and industrial wastewater/solid waste, entry of diffused nutrients source from agricultural and forestry, improper management of storm water, over-exploitation of lake for activities like recreation, fishing, encroachments, land reclamation etc causing lake water shrinkage, shoreline erosion and impacting the lake hydrology, deterioration of water quality, impacting biodiversity, bringing climate changes, etc. There is, therefore, an immediate need to know the pollution status of a lake at a given time so that necessary conservation activities may be undertaken to regain/improve the health of water body.

Project Area

The Vrishabhavathi a fourth order upstream river drains an aerial extent of 545 sq. km before it joins Suvarnamukhi river at Bhadrachundamadoddi (North latitude $12^{\circ} 39' 40''$ and East longitude $77^{\circ} 25' 00''$) of Kanakapura taluk. The river Suvarnamukhi is one of the major tributaries of the river Arkavathi in Karnataka, part of the Cauvery Basin. The Vrishabhavathi stream system terminating at Byramangala tank. This has an aerial extent of 337.84 sq.km. It is encompassed by East longitude $77^{\circ} 23' 45''$ - $77^{\circ} 34' 16''$ and North latitude $12^{\circ} 45' 00''$ - $13^{\circ} 02' 40''$. The topographic coverage of the area is in the survey of India topographic maps No. 57 H/5, H/9 and G/12 on scale 1:50000. Byramangala tank is in Bidadi Hobli of Ramanagaram district. The



catchment of reservoir includes Bangalore urban areas which comes under Bhruhath Bangalore Mahanagara Palike and villages of Bangalore rural area, Rajajinagar Industrial area, Peenya Industrial area, Kumbalgod Industrial area and the Bidadi Industrial are in the Reservoir catchment area. The Vrishabhavathi river which flows in the catchment carries urban domestic sewage, industrial sewage and storm water from urban, semi urban and rural areas. The agricultural wastes resulting from intensive farming in the rural areas of the catchment also enter the reservoir. The reservoir is highly polluted, and the reservoir sediments are also contaminated. The annual rainfall data of 789mm and average monsoon rainfall of 551.69mm were collected from the records of the rain gauge installed at Byramangala. The minimum annual inflow to the reservoir is 23.92M^3 and maximum annual inflow is $114.5 \times 10^9 \text{M}^3$. The withdrawal from canal is recorded as 34.97M cum and the reservoir losses are noted up to 5.42M cum. The details of reservoir indicated FRL as 24.10Mm^3 , live storage at FRL as 22.01Mm^3 , dead storage at sill level of sluice as 2.09Mm^3 and water spread area at FRL as 430.25ha . The spillway of the reservoir is of broad crested type located at right flank. The length of spillway is 150.5m , its flood lift is recorded as 0.9m and discharge capacity is 230cumecs . The bund constructed for Byramangala reservoir is of earthen type and its height at the deepest point is recorded as 22.85m . The length of the bund is recorded as 2286m and top width of the bund as 3.66m . The MWL of the reservoir is noted as 32.9m its FRL as 32m and its sill level as 22.85m . The Reservoir is provided with 2 channels, viz. Left Bank canal and Right bank canal. The left bank canal is 26.4 km in length and Right bank canal is 8.4 km length having a command area of 1330 ha and right bank canal is 8.4 km having a command area of 444ha .

Based on the reconnaissance survey, the soil in the command area is polluted with the application of sewage water. The trophic status refers to the level of productivity in a lake as measured by phosphorous, algae abundance and depth of light penetration. TSI (Trophic Status Index) rates individual lakes, ponds and reservoirs based on the amount of biological productivity occurring in the water. Using the index, one can get a quick idea about the extent of productivity of a lake (Hillsborough 2008). TSI values can be used to rank lakes within a region and between the regions. This ranking enables the water managers to target lakes that may require restoration or conservation activities. An increasing trend in TSI over a period of several years may indicate degradation of the health of a lake.

Thus, water is found to be unfit for drinking and irrigation purpose. Since the TSI value is above 71, at all locations of Byramangala lake, it is said to be Hypereutrophic. The lake is said to have



heavy algal blooms possible throughout the summer, dense macrophyte beds, but limited light penetration.

Industrial waste is a major contributor to the pollution of tanks. Once the waste is disposed of into the water bodies without proper treatment it renders the Reservoir water unfit for use. The factors that affect the pollution of water depend on the type of industries, the nature of waste disposal etc. Many industries are situated in the catchment area and adjacent to the river disposing of their effluents without any primary treatment. These pollutants enter the water bodies it had polluted the entire reservoir and makes the water unsuitable.

Considering the above reason, it is also important to note that intensive farming in the village should be reduced. In many cases it is seen that the inflow of pollution into Byramangala reservoir is from ground water, as one of the sources, hence pollution of the ground water by the source has to be eliminated. Chemical fertilizers are a major contributor to the pollution of ground water. The results of Physico-Chemical and bacteriological analysis of water samples in the catchment, and command area reveal that water is highly polluted at certain areas where industrial effluents were directly discharged. Heavy metals were also detected in ground and surface water samples which were above the tolerance limits. Soil samples collected have low organic carbon, micro and macronutrients. Heavy metals were detected above the permissible limits in the soil and vegetation samples which were fed with reservoir water in the command area. The villages unfortunately depend on this water.

The bore well yielding water at this location contains highly concentrated fluorides, nitrates etc., which is not suitable for even agricultural activities. The fruits and vegetables growing in this region all contains rich nitrogen and other nutrients which is not good for human health also the animals feeding milk in this area is not up to drinking standard.

The cost effective and less energy intensive treatment methodology may be adopted to control the pollution emanating from point and non-point sources. The techno-ecological treatment systems such as soil Scape filter, Hydrash succession pond, and Green bridge technology may be adopted to prevent further pollution.

Hence to overcome this problem Hon'ble WRD minister instructed to prepare DPR to divert the sewage entry into the reservoir in lean period, to fill it during flood season.

Project Proposal

Now it is proposed to construction of Diversion weir at downstream of existing Shanamangala Bridge. And to divert the sewage of lean flow for entire year by proposing diversion channel.



The maximum flood discharge based on Ryve's formula is ascertained by area capacity method. Based on HFL RL the scour depth is worked out. The pickup behaves as a free over fall weir during the flood discharge. The critical condition of discharge over the pickup is when the discharge in the nala is at FTL or HFL (whichever is lower). The spillage and hydraulic jump characteristics are determined for this critical condition. The length of apron proposed is based on hydraulic jump length or twice the height of pickup weir whichever is less.

The free over fall weir of gravity section having a length of 68.00m is proposed to be constructed for a height of 2.0 m above nala bed. The body of weir is taken below nala bed based on scour depth calculations. The body wall, abutments, wingwalls and key walls are proposed in M20 - 40mm concrete with nominal reinforcement. Dowel bar are proposed for anchoring the structure. Upstream and downstream aprons baffle blocks are proposed in M20 - 40mm concrete with nominal reinforcement to avoid any possible erosion on the downstream of the pickup. A downstream cutoff wall is proposed to increase the creep length. The channel of 6805m length and total width of 4.25m is proposed for around discharge of 280 Cusecs.

Minor improvement to the tank is proposed which are namely, jungle clearance, contour bund on left side and desilting.

The detailed project report for Gravity main, pumping main is prepared considering current schedule of rates of WRD for the year 2017-18, current schedule of rates of MI for the year 2017-18. Which is works out Rs.110 crores. The DPR was submitted Estimate Review Committee (ERC) for clearance and got cleared in the 46th ERC meeting, the same was submitted to obtain Administrative approval from the Government. Now the Government has accorded Administrative approval for Rs.110 Crores vide Govt. Order WRD / 157 / MMK / 2018 / Bengaluru dated 23/11/2018.

The detailed estimate is prepared Rs.110 Crores and submitted to obtain Technical Sanction.

[Signature]
Section Officer

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Assistant Executive Engineer
K. P. M. Sub-Division, Channapatna

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Executive Engineer
M. P. Division, Ramanagara

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ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ನಡವಳಿಕೆಗಳು

ವಿಷಯ: ರಾಮನಗರ ಜಿಲ್ಲೆ, ರಾಮನಗರ ತಾಲ್ಲೂಕಿನ ಬೈರಮಂಗಲ ಜಲಾಶಯಕ್ಕೆ ಡೈವರ್ಷನ್ ಕಾಲುವೆ ಮತ್ತು ವಿಯರ್ ನಿರ್ಮಿಸುವ ಯೋಜನೆಯ ಇ.ಪಿ.ಆರ್ ಪ್ರಸ್ತಾವನೆಗೆ ಆಡಳಿತಾತ್ಮಕ ಅನುಮೋದನೆ ನೀಡುವ ಬಗ್ಗೆ.

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ಓದಲಾಗಿದೆ :-

ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕಾವೇರಿ ನೀರಾವರಿ ನಿಗಮ, ಬೆಂಗಳೂರು, ಇವರ ಪತ್ರ ಸಂಖ್ಯೆ:ಕಾನೀನಿ/ತಾಂತ್ರಿಕ-3/ಎಂ.ಪಿ.ಡಿ-240/2018-19/2220, ದಿನಾಂಕ:09-10-2018.

ಪ್ರಸ್ತಾವನೆ :-

ಮೇಲೆ ಓದಲಾದ ಪತ್ರದಲ್ಲಿ ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕಾವೇರಿ ನೀರಾವರಿ ನಿಗಮ ನಿಯಮಿತ, ಬೆಂಗಳೂರು, ಇವರು ಉಲ್ಲೇಖಿತ ವಿಷಯದ ಬಗ್ಗೆ ಪ್ರಸ್ತಾವನೆ ಸಲ್ಲಿಸುತ್ತಾ, ರಾಮನಗರ ಜಿಲ್ಲೆಯ ರಾಮನಗರ ತಾಲ್ಲೂಕಿನ ಬೈರಮಂಗಲ ಜಲಾಶಯವನ್ನು 1942 ರಲ್ಲಿ 0.80 ಟಿ.ಎಂ.ಸಿ. ನೀರಿನ ಸಂಗ್ರಹಣಾ ಸಾಮರ್ಥ್ಯಕ್ಕೆ ನಿರ್ಮಿಸಲಾಗಿದೆ ಹಾಗೂ ಈ ಜಲಾಶಯಕ್ಕೆ ಬೆಂಗಳೂರು ನಗರದ ಮಳೆ ನೀರು ವ್ಯವಸ್ಥಾಪಕಿ ನದಿಯ ಮೂಲಕ ಹರಿದು ಬರುತ್ತಿದ್ದು, ನಿರ್ಮಾಣಗೊಂಡ ವರ್ಷಗಳಲ್ಲಿ ಜಲಾಶಯದಿಂದ ಕೃಷಿ ಚಟುವಟಿಕೆ ಮತ್ತು ಕುಡಿಯುವ ನೀರಿಗಾಗಿ ಉಪಯೋಗಿಸಿಕೊಳ್ಳಲಾಗುತ್ತಿತ್ತು ಎಂದು ವರದಿ ಮಾಡಿರುತ್ತಾರೆ. ಇತ್ತೀಚಿನ ದಶಕಗಳಲ್ಲಿ ಬೆಂಗಳೂರು ನಗರವು ಬೃಹದಾಕಾರವಾಗಿ ಬೆಳೆದು ಈ ಜಲಾಶಯಕ್ಕೆ ಬರುತ್ತಿರುವ ವ್ಯವಸ್ಥಾಪಕಿ ನೀರು ತುಂಬಾ ಕಲುಷಿತವಾಗಿರುತ್ತದೆ. ಜೊತೆಗೆ ಜಲಾಶಯದ ಮೇಲ್ಭಾಗದಲ್ಲಿರುವ ಕೈಗಾರಿಕೆಗಳಿಂದ ಕಲುಷಿತ ನೀರು ಸಹಾ ಜಲಾಶಯವನ್ನು ಸೇರಿ ಸಂಗ್ರಹಣೆಯಿಂದ ಜಲಾಶಯದ ನೀರು ಕಲುಷಿತಗೊಂಡಿರುತ್ತದೆ. ಈ ಜಲಾಶಯದ ಅಡಿಯಲ್ಲಿ ಸುಮಾರು 1600 ಹೆ. ಪ್ರದೇಶದಲ್ಲಿ ನೀರಾವರಿ ಮತ್ತು ಕೃಷಿ ಚಟುವಟಿಕೆ ನಡೆಯುತ್ತಿದ್ದು, ಈ ನೀರಿನಿಂದ ಬೆಳೆದಿರುವ ಹಣ್ಣು, ತರಕಾರಿ ಮತ್ತು ಇತರ ಬೆಳೆಗಳು ಆರೋಗ್ಯಕ್ಕೆ ಹಾನಿಕಾರಕವಾಗಿರುತ್ತದೆ. ಅಲ್ಲದೇ, ಸುತ್ತಮುತ್ತಲಿನ ಕೊಳವೆ ಬಾವಿಗಳಲ್ಲಿ ದೊರೆಯುವ ನೀರೂ ಸಹಾ ಕಲುಷಿತವಾಗಿದ್ದು, ನೀರಿನಲ್ಲಿ ಆರೋಗ್ಯಕ್ಕೆ ಹಾನಿಕಾರಕವಾಗಿರುವ ರಾಸಾಯನಿಕ ಅಂಶಗಳು ಅಧಿಕವಾಗಿದ್ದು (more than permitted limits), ಕುಡಿಯಲು ಯೋಗ್ಯವಾಗಿರುವುದಿಲ್ಲ. (unpotable)

2. ಆದ್ದರಿಂದ, ಈ ಜಲಾಶಯವನ್ನು ಸಂರಕ್ಷಿಸಲು ಹಾಗೂ ಜಲಾಶಯಕ್ಕೆ ಪ್ರವೇಶಿಸುವ ಕಲುಷಿತ ನೀರನ್ನು ಹೊಸ ತಿರುವು ಕಾಲುವೆ (diversion channel) ನಿರ್ಮಿಸಿ ಅದರ ಮೂಲಕ ಜಲಾಶಯದ ಕೆಳಭಾಗಕ್ಕೆ ಹರಿಸಲು ಹಾಗೂ ಪ್ರವಾಹದ ಸಮಯದಲ್ಲಿ ಬರುವ ಕನಿಷ್ಠ ಕಲುಷಿತ ಪ್ರಮಾಣದ ನೀರನ್ನು ಗೇಟುಗಳ ಮೂಲಕ ಜಲಾಶಯಕ್ಕೆ ತುಂಬಿಸಲು ಉದ್ದೇಶಿಸಲಾಗಿದೆ.

3. ಶಾನಮಂಗಲ ಸೇತುವೆ ಕೆಳಭಾಗದಲ್ಲಿ ವ್ಯವಸ್ಥಾಪಕಿ ನದಿಗೆ ಅಡ್ಡಲಾಗಿ 68 ಮೀ. ಉದ್ದದ weir ಅನ್ನು ನಾಲಾ ತಳಮಟ್ಟದಿಂದ 2 ಮೀ. ಎತ್ತರಕ್ಕೆ ಡೈವರ್ಷನ್ weir ಅನ್ನು ನಿರ್ಮಿಸಿ ಕಲುಷಿತ ನೀರನ್ನು ಬೈರಮಂಗಲ ಕೆರೆಯ downstream ನಲ್ಲಿ ತಿರುವು ಕಾಲುವೆ ಮುಖಾಂತರ ಬಿಡಲು ಉದ್ದೇಶಿಸಿದೆ. ಆದ್ದರಿಂದ ನದಿಯಲ್ಲಿ ಪ್ರವಾಹದ ನೀರು ಹರಿಯುವ ಸಮಯದಲ್ಲಿ weir ನ Flood gate ಮೂಲಕ ಬೈರಮಂಗಲ ಕೆರೆಗೆ ನೀರನ್ನು ಹರಿಯಲು ಬಿಟ್ಟು ಕೆರೆಯನ್ನು ತುಂಬಿಸಲಾಗುವುದು ಮತ್ತು ಪ್ರವಾಹದ ನೀರು ಕಡಿಮೆಯಾದಾಗ ಕಲುಷಿತ ನೀರು ಬೈರಮಂಗಲ ಕೆರೆಗೆ ಹೋಗುವುದನ್ನು ತಡೆದು ಪ್ರತ್ಯೇಕವಾಗಿ ನಿರ್ಮಿಸುವ ಕಾಲುವೆ ಮೂಲಕ ಬೈರಮಂಗಲ ಕೆರೆ ದಾಟಿದ ನಂತರ ಸದರಿ ನದಿಗೆ ಹರಿಯಲು ಬಿಡಲಾಗುತ್ತದೆ. ಉದ್ದೇಶಿತ 6.805 ಕಿ.ಮೀ. ಉದ್ದದ ಕಾಲುವೆಯನ್ನು 4.25 ಮೀ. ಅಗಲಕ್ಕೆ ಹಾಗೂ 280 ಕ್ಯೂಸೆಕ್ ಸಾಮರ್ಥ್ಯಕ್ಕೆ ನಿರ್ಮಿಸಲಾಗುವುದು. ಅಲ್ಲದೇ, ಡೈವರ್ಷನ್ weir ಗೆ ಸ್ಥಳಕ್ಕನುಗುಣವಾಗಿ ರಕ್ಷಣಾತ್ಮಕ ಕಾಮಗಾರಿಗಳನ್ನು ಕೈಗೊಳ್ಳಲು ಅನುವು ಮಾಡಿಕೊಳ್ಳಲಾಗಿದೆ.

4. ಸದರಿ ಪ್ರಸ್ತಾವನೆಯಲ್ಲಿ ಬೈರಮಂಗಲ ಕೆರೆಯಲ್ಲಿ ಜಂಗಲ್ ತೆಗೆಯುವುದು, ಹೂಳು ತೆಗೆಯುವುದು ಮತ್ತು ಎಡಭಾಗದಲ್ಲಿ Contour Bund ನಿರ್ಮಿಸಲು ಅನುವು ಮಾಡಿಕೊಂಡು ಕೆರೆಯನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಲು ಉದ್ದೇಶಿಸಲಾಗಿರುತ್ತದೆ.

5. ಸರ್ವೇ ವರದಿಯನ್ವಯ ಜಲಾನಯನ ಪ್ರದೇಶದ ಮಣ್ಣು ಕಲುಷಿತಗೊಂಡಿರುವ ನೀರಿನಿಂದ ಮಣ್ಣು ಮಾಲಿನ್ಯವಾಗಿರುತ್ತದೆ. ಬೈರಮಂಗಲ ಜಲಾಶಯದ Trophic status Index (TSI) 71 ಕ್ಕಿಂತ ಹೆಚ್ಚಾಗಿ ಇರುವುದರಿಂದ ಕುಡಿಯಲು ಮತ್ತು ನೀರಾವರಿಗೆ ಯೋಗ್ಯವಾಗಿರುವುದಿಲ್ಲ.
6. ಈ ಯೋಜನೆಯಡಿಯಲ್ಲಿ ಶಾನಮಂಗಳ ಸೇತುವೆ ಕೆಳಭಾಗದಲ್ಲಿ Diversion weir ಅನ್ನು ನಿರ್ಮಿಸಿ ಅಲ್ಲಿಂದ Diversion channel ಮೂಲಕ ಕಲುಷಿತ ನೀರನ್ನು ಜಲಾಶಯದ ಕೆಳಭಾಗದಲ್ಲಿ ವ್ಯವಸ್ಥಾಪಕಿ ನದಿ ಪಾತ್ರಕ್ಕೆ ಹರಿಸಲಾಗುವುದು.
7. ಈ ಹಿನ್ನೆಲೆಯಲ್ಲಿ, ರಾಮನಗರ ಜಿಲ್ಲೆ, ರಾಮನಗರ ತಾಲ್ಲೂಕಿನ ಬೈರಮಂಗಲ ಜಲಾಶಯಕ್ಕೆ ಡೈವರ್ಷನ್ ಕಾಲುವೆ ಮತ್ತು ವಿಯರ್ ನಿರ್ಮಿಸುವ ರೂ.110.00 ಕೋಟಿ ಮೊತ್ತದ ವಿವರವಾದ ಯೋಜನಾ ವರದಿಗೆ ಆಡಳಿತಾತ್ಮಕ ಅನುಮೋದನೆ ನೀಡುವಂತೆ ಕೋರಿ ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕಾವೇರಿ ನೀರಾವರಿ ನಿಗಮ, ಇವರು ಪ್ರಸ್ತಾವನೆ ಸಲ್ಲಿಸಿರುತ್ತಾರೆ.
8. ಸದರಿ ಪ್ರಸ್ತಾವನೆಯನ್ನು ಸರ್ಕಾರದ ಮಟ್ಟದಲ್ಲಿ ಕೂಲಂಕಷವಾಗಿ ಪರಿಶೀಲಿಸಿ ಈ ಕೆಳಕಂಡಂತೆ ಆದೇಶಿಸಲಾಗಿದೆ.

ಸರ್ಕಾರಿ ಆದೇಶ ಸಂಖ್ಯೆ : ಜಸಂಇ 157 ಎಂಎಂಕೆ 2018,

ಬೆಂಗಳೂರು, ದಿನಾಂಕ : 23-11-2018

ರಾಮನಗರ ಜಿಲ್ಲೆ, ರಾಮನಗರ ತಾಲ್ಲೂಕಿನ ಬೈರಮಂಗಲ ಜಲಾಶಯಕ್ಕೆ ಡೈವರ್ಷನ್ ಕಾಲುವೆ ಮತ್ತು ವಿಯರ್ ನಿರ್ಮಿಸುವ ರೂ.110.00 ಕೋಟಿ (ರೂಪಾಯಿ ಒಂದು ನೂರಾ ಹತ್ತು ಕೋಟಿಗಳು ಮಾತ್ರ) ಗಳ ಮೊತ್ತದ ವಿವರವಾದ ಯೋಜನಾ ವರದಿಗೆ ಸರ್ಕಾರದ ಆಡಳಿತಾತ್ಮಕ ಅನುಮೋದನೆ ನೀಡಲಾಗಿದೆ.

2. ಈ ಆದೇಶವು ಕರ್ನಾಟಕ ಸರ್ಕಾರದ (ಕಾರ್ಯಕಲಾಪಗಳ ನಿರ್ವಹಣೆ) ನಿಯಮಗಳು, 1977 ರ 17ನೇ ನಿಯಮದ (2)ನೇ ಉಪ ನಿಯಮದ ಪರಂತುಕದ ವ್ಯಾಪ್ತಿಯೊಳಗೆ ಬರುತ್ತದೆ ಮತ್ತು ಅದರಂತೆ ಹೊರಡಿಸಲಾಗಿದೆ.

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆದೇಶಾನುಸಾರ
ಮತ್ತು ಅವರ ಹೆಸರಿನಲ್ಲಿ

(ಬಿ.ಹರಿನಾರಾಯಣ)

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ (ತಾಂತ್ರಿಕ-2)

ಜಲ ಸಂಪನ್ಮೂಲ ಇಲಾಖೆ.

ಇವರಿಗೆ :-

1. ಪ್ರಧಾನ ಮಹಾಲೇಖಪಾಲರು, (ಸಾಮಾನ್ಯ ಮತ್ತು ಸಾಮಾಜಿಕ ವಲಯ ಲೆಕ್ಕಪರಿಶೋಧನ), ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
2. ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕಾವೇರಿ ನೀರಾವರಿ ನಿಗಮ, ಬೆಂಗಳೂರು.
3. ಮುಖ್ಯ ಇಂಜಿನಿಯರ್, ನೀರಾವರಿ (ದಕ್ಷಿಣ) ವಲಯ, ಮೈಸೂರು.
4. ವಿಶೇಷಾಧಿಕಾರಿ ಹಾಗೂ ಪದನಿಮಿತ್ತ ಸರ್ಕಾರದ ಉಪ ಕಾರ್ಯದರ್ಶಿಗಳು, ಆರ್ಥಿಕ ಇಲಾಖೆ (ಲೋ.ಇ. ಆರ್ಥಿಕ ಕೋಶ), ವಿಧಾನ ಸೌಧ, ಬೆಂಗಳೂರು.
5. ಸರ್ಕಾರದ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿ (ಸಚಿವ ಸಂಪುಟ), ಕರ್ನಾಟಕ ಸರ್ಕಾರ (ಪ್ರಕರಣ ಸಂಖ್ಯೆ:ಸಿ-684/2018, ದಿನಾಂಕ:19-11-2018).
6. ಶಾಖಾ ರಕ್ಷಾ ಕಡತ / ಹೆಚ್ಚುವರಿ ಪ್ರತಿಗಳು.

Construction of diversion weir and channel for Byramangala reservoir of Ramanagara taluk

I) Discharge Calculation by cross section Area - Velocity method

Sl. No.	Chainage m	River Bed level	Observed HFL	Weir Top level	Depth upto HFL	Width m	Area Sqm	Perimeter m
1	0	697.959	696.600	695.500	0.000	0	0.00	0.00
2	2	697.716	696.600	695.500	0.000	2	0.00	0.00
3	4	697.470	696.600	695.500	0.000	2	0.00	0.00
4	6	697.398	696.600	695.500	0.000	2	0.00	0.00
5	8	697.327	696.600	695.500	0.000	2	0.00	0.00
6	10	697.255	696.600	695.500	0.000	2	0.00	0.00
7	12	697.184	696.600	695.500	0.000	2	0.00	0.00
8	14	697.113	696.600	695.500	0.000	2	0.00	0.00
9	16	697.041	696.600	695.500	0.000	2	0.00	0.00
10	18	696.970	696.600	695.500	0.000	2	0.00	0.00
11	20	696.872	696.600	695.500	0.000	2	0.00	0.00
12	22	696.769	696.600	695.500	0.000	2	0.00	0.00
13	24	696.666	696.600	695.500	0.000	2	0.00	0.00
13	25.29	696.600	696.600	695.500	0.000	1	0.00	0.00
14	26	696.564	696.600	695.500	0.036	2	0.04	2.00
15	28	696.461	696.600	695.500	0.139	2	0.18	2.00
16	30	696.358	696.600	695.500	0.242	2	0.38	2.00
17	32	696.256	696.600	695.500	0.344	2	0.59	2.00
18	34	696.185	696.600	695.500	0.415	2	0.76	2.00
19	36	696.132	696.600	695.500	0.468	2	0.88	2.00
20	38	696.078	696.600	695.500	0.522	2	0.99	2.00
21	40	696.046	696.600	695.500	0.554	2	1.08	2.00
22	42	696.059	696.600	695.500	0.541	2	1.10	2.00
23	44	696.029	696.600	695.500	0.571	2	1.11	2.00
24	46	695.977	696.600	695.500	0.623	2	1.19	2.00
25	48	695.925	696.600	695.500	0.675	2	1.30	2.00
26	50	695.872	696.600	695.500	0.728	2	1.40	2.00
27	52	695.881	696.600	695.500	0.719	2	1.45	2.00
28	54	695.924	696.600	695.500	0.676	2	1.40	2.00
29	56	695.899	696.600	695.500	0.701	2	1.38	2.00
30	58	695.874	696.600	695.500	0.726	2	1.43	2.00
31	60	695.848	696.600	695.500	0.752	2	1.48	2.00
32	62	695.823	696.600	695.500	0.777	2	1.53	2.00
33	64	695.797	696.600	695.500	0.803	2	1.58	2.00
34	66	695.808	696.600	695.500	0.792	2	1.60	2.00
35	68	695.877	696.600	695.500	0.723	2	1.52	2.00
36	70	695.946	696.600	695.500	0.654	2	1.38	2.00
37	72	696.015	696.600	695.500	0.585	2	1.24	2.00
38	74	696.084	696.600	695.500	0.516	2	1.10	2.00
39	76	696.098	696.600	695.500	0.502	2	1.02	2.00
40	78	696.152	696.600	695.500	0.448	2	0.95	2.00
41	80	696.224	696.600	695.500	0.376	2	0.82	2.00
42	82	696.220	696.600	695.500	0.380	2	0.76	2.00
43	84	696.215	696.600	695.500	0.385	2	0.76	2.00
44	86	696.210	696.600	695.500	0.390	2	0.77	2.00

Construction of Diversion Weir and Channel for Byramanagala Reservoir of Ramanagara Taluk, Ramanagara District

RECAPITULATION

MAIN		Amount (Rs.)
Sub Estimate No. 1.1	Estimate for Construction of Diversion Weir	145,35,000/-
Sub Estimate No. 1.2	Estimate for Construction of Diversion Channel	55,59,000/-
Sub Estimate No. 1.3	Estimate for Construction of Estimate for Construction of Ring Bund and Desilting	41,40,352.50
OTHERS		10,03,290.00/-
Sub Estimate No. 2.1	Provisions for Land Acquisition	75,240,000/-
Sub Estimate No. 2.2	Provisions for Quality supervision and Miscellaneous	7,506,203/-

Total Rs. 1,083,573,203/-
 Rounding off. 16,426,797/-
 Grand Total Rs. 1,100,000,000/-

Section Officer
 K. R. S. M & M. I. P Circle, Mandya

Assistant Executive Engineer
 K. P. M. Sub-Division, Channarayana

Executive Engineer
 M. P. Division, Ramanagara

Superintending Engineer
 K. R. S. M & M. I. P Circle, Mandya

Chief Engineer
 Irrigation (South) Zone, CNL, Mysore

SANCTIONED

CER No: 150/2018-19

Head of Account: Other works under capital head - Implementation to canal.

Name of the work: Construction of diversion canal from river Varahabalu to bypass Byramanagala tank to lead the water to downstream and ten crores only.

For ₹: 1,10,00,00,000/- (₹ One hundred and ten crores only)

AEJE
 Technical Officer
 Chief Engineer
 Designs

Irrigation (South) Zone, CNL, Mysore-570 024

Sl. NO.	Items of work	Unit	Nos	Length	Width	Height	Qty.	Rate	Amount
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- 1 Clearing thick jungle growth (less than 50 percent open space) including bushes upto 300mm/parthenium and other weeds including burning or disposing off the same as directed etc., complete as per specifications.
(WRD SR 2016-17, Page No 151, Item no.8.1.2)

Sqm.	1	12,172.00	8.00				97,376.00		
Sqm.	1	1,200.00	50.00				60,000.00		

Total 1,57,376.00 ✓

Less 20% 19,475.00 31475.20 ✓

Net qty. 1,37,901.00 2.03 ✓ 1,97,673.00 255,578.60
125900.80 ✓

- 2 Excavation in all kinds of soil including boulders upto 0.6 m diameter (0.113 cum) for canal, seating of embankment, filter drains / catch water drains etc., and placing the excavated stuff neatly in dump area or for formation of service road / embankment as directed including cost of all materials, machinery, labour, dressing bed and sides to required level and profile etc., complete with lead upto 1 km and depth of cut upto 18 m. For depth of cut exceeding 8 m from ground level increase the basic rate by 5 percent for the quantity of excavation beyond 18 m depth
(WRD SR 2016-17, Page No 54, Item no.3.1)

Cum.	2	12,172.00	2.00	2.50	1,21,720.00	80.08	97,47,338.00
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Calculation of total embankment for bund:

Cum.	1	12,172.00	$\frac{10.00 + 8.00}{2}$	1.00	1,09,548.00
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Cum.	1	12,172.00	$\frac{8.00 + 5.00}{2}$	1.25	98,898.00
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Total qty. of embankment 2,08,446.00 Cum.

- 3 Providing semi-pervious / pervious casing embankment with soil collected in embankment area in heaps as part of disposal of excavated soil from canal including cost of all materials, machinery, labour, all operations such as sorting-out, spreading soil in layer of 250 to 300 mm before compaction, breaking clods, sectioning, watering and compacting each layer to density control of not less than 95 percent or as stipulated by power roller etc., complete with lead upto 1 km for water.
(M.I. Circle S.R. 2014-15 It. No. 13 / Page - 54)

Qty. as in It. No. 2 above	1,21,720.00	Cum.
Deduct for shrinkage 10%	12,172.00	Cum.
Net qty.	1,09,548.00	Cum.

1,09,548.00 74.00 81,06,552.00

- 4 Providing casing embankment for breached / damaged portion of canal using pervious / semi-pervious soil from approved dump areas in layers of 100 to 150 mm (before compaction) including cost of all materials, machinery, labour, all operations such as collection of soil, spreading soil in layer of specified thickness, sorting out, breaking clods, sectioning sides / edges, watering, compacting each layer to density control of not less than 95 percent or as stipulated using power roller or pneumatic / vibrating plate compactors etc., complete with lead upto 1 km and all lifts.
(WRD SR 2016-17, Page No 156, Item no.8.25)

Net qty. = 98,898.00 Cum. 98,898.00 188.24 1,86,16,856.00

- 5 Excavation and removal of silt and silt mixed with sand in slussy condition from canal bed including disposing off the same in spoil bank or on the canal embankment in layers as directed etc., complete with lead upto 50 m and all lifts.
(WRD SR 2016-17, Page No 157, Item no.8.35)

Cum.	1	1,200.00	1,000.00	0.90	10,80,000.00	349.34	37,72,87,200.00
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4,14,01,352.00 Total 41,39,55,619.00

Rounding off 41,40,00,000.00

Construction of Diversion Weir and Channel for Byramangala Reservoir of Ramanagara Taluk,
Ramanagara District

Sub Estimate No. 1.3

Estimate for Construction of Ring Bund and Desilting

Sl. No.	Description of Items	No	Length	Breadth	Depth	Quantity	Rate / Unit	Amount (Rs.)
1	Clearing thick jungle growth (less than 50 percent open space) including bushes up to 300 mm / parthenium and other weeds including burning or disposing off the same as directed etc., complete. [Vide WRD SR 2016-17, Page No 151, Item No 8.1.2]							
	Contour Bund	1	12172.00	8.00		97376.00		
	Tank Bund	1	1200.00	50.00		60000.00		
						157376.00		
	Deductions				-20%	-19475.20		
						295276.80	2.03 /Sq.m	599411.90
2	Excavation in all kinds of soil including boulders up to 0.6 m diameter (0.113 cum) and placing excavated stuff neatly in specified dump area or disposing off the same as directed for approach channel / foundation of jack-well / pump house / delivery chamber and appurtenant structures including cost of all materials, machinery, labour, working in wet and watery site conditions (excluding dewatering) etc., complete with lead up to 1 km and all lifts. [Vide WRD SR 2016-17, Page No 96, Item No 5.1.1]							
	Contour Trench	2	12172.00	2.00	2.50	121720.00		
						121720.00	96.72 /C. m	1172758.40
3	Providing casing embankment for breached / damaged portion of canal using pervious / semi-pervious soil from approved dump areas in layers of 100 to 150 mm (before compaction) including cost of all materials, machinery, labour, all operations such as collection of soil, spreading soil in layer of specified thickness, sorting out, breaking clods, sectioning sides / edges, watering, compacting each layer to density control of not less than 95 percent or as stipulated using power roller or pneumatic / vibrating plate compactors etc., complete with lead upto 1 km and all lifts. [Vide WRD SR 2016-17, Page No 156, Item No.8.25]							
	Contour Bund	1	12172.00	2.00	3.80	92507.20		
				3.80	2.50	92507.20	188.24 /Cum	17413555.33
4	Excavation and removal of silt and silt mixed with sand in slussy condition from canal bed including disposing off the same in spoil bank or on the canal embankment in layers as directed etc., complete with lead upto 50 m and all lifts. [Vide WRD SR 2016-17, Page No 157, Item No 8.35]							
	Desilting	1	1000.00	1000.00	0.90	1080000.00		
						1080000.00	349.34 /Cum	377287200.00
Total Rs.								407072925.63
Rounding off to next 1000 Rs.								407073000.00

both sides
of tank

Section Officer

Assistant Executive Engineer
K. P. M. Sub-Division, Channapatna

Executive Engineer
M. P. Division, Ramanagara