

P-15011/46/2022-Office of DC SPR-MOWR-Part (1)/3158-60

Government of India  
Ministry of Jal Shakti  
State Projects Wing

431, Shram Shakti Bhawan,  
Rafi Marg, New Delhi-110001  
Dated: 28<sup>th</sup> November, 2023

To,  
The Secretary (Irrigation),  
Government of Uttarakhand,  
Deharadun.

**Sub: Issues regarding Jamrani project, Uttarakhand -reg.**

**Ref: Letter No 739/Secy/GoU/Irrigation/Jamrani dam dated 30.10.2023**

Sir,

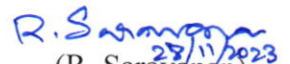
This has reference to the above referred letter dated 30.10.2023, regarding the issues pertaining to Jamrani dam.

As far as proposed change in method of placement of concrete for the dam from RCC to CVC is concerned, a Committee has been constituted under Member (D&R), CWC, New Delhi, to take a final view in the matter. A copy of the OM reg. constitution of the said Committee is **enclosed** herewith for your ready reference.

Regarding updation of the project cost, there are two aspects to it. One, if the State Government desires, it may submit the revised cost / re-appraisal proposal (in case scope of the project is also changed) to Central Water Commission (CWC) through ePAMS. CWC shall take up the cost revision/ re-appraisal and firm up the revised cost as per the desired price level. However, even with cost revision, there is no provision for change in central assistance to be given to the project under AIBP beyond the capping recommended by the PIB.

**Enclosure: As above**

Yours sincerely,

  
(R. Saravanan)  
Deputy Director

**Copy for kind information to:**

1. Member (WP&P), Central Water Commission, New Delhi.
2. Member (D&R), Central Water Commission, New Delhi.

Government of India  
Ministry of Jal Shakti  
State Projects Wing

431, Shram Shakti Bhawan,  
Rafi Marg, New Delhi-110001  
Dated: 28<sup>th</sup> November, 2023

**OFFICE MEMORANDUM**

**Sub: Constitution of Review Committee for examining the issue of methodology to be adopted for placement of concrete/ type of dam for Jamrani Project, Uttarakhand-reg.**


I am directed to convey the decision of the competent authority for constitution of the following Committee to examine the issue of method of placement of concrete/ type of dam for Jamrani project, Uttarakhand.

- |  |                    |
|--|--------------------|
| 1. Member (D&R), Central Water Commission, New Delhi | - Chairman         |
| 2. Chief Engineer (Designs – N&W), CWC, New Delhi    | - Member Secretary |
| 3. Director (CSMRS), New Delhi                       | - Member           |
| 4. Chief Engineer, Jamrani project, Uttarakhand      | - Member           |
| 5. Director (FE&SA), CWC, New Delhi                  | - Member           |
| 6. Director (CMDD N&W), CWC, New Delhi               | - Member           |

(The Committee may co-opt any other member(s) as per requirement).

The Committee may examine, and give its specific recommendations, on the the issue of method of placement of concrete/ type of dam for Jamrani project brought out by Government of Uttarakhand vide letter dated 30<sup>th</sup> October 2023 (**enclosed**), within one month of constitution of the Committee.

**Enclosure: As above**

  
(R. Saravanan)  
Deputy Director

To:

1. Member (D&R), Central Water Commission, New Delhi
2. Chief Engineer, (Designs – N&W), CWC, New Delhi
3. Director, CSMRS, New Delhi
4. Chief Engineer, Jamrani project, Uttarakhand
5. Director (FE&SA), CWC, New Delhi
6. Director (CMDD N&W), CWC, New Delhi

**Copy for kind information to:**

1. Chief Engineer, PMO, CWC, New Delhi.
2. Chief Engineer, UGBO, CWC, Lucknow.

From,

Secretary, Irrigation  
Govt. of Uttarakhand

To,

Secretary  
Ministry of Jal Shakti  
Shrm Shkti Bhawan, New Delhi

No. 739 /Secy/GoU/Irrigation/Jamrani dam

Dated: 30/10/2023

Subject: - Regarding financial approval of amended & revised cost estimate of Rs 3751.59 cr. for conventional concrete dam component & appurtenant works of Jamrani dam Multipurpose Project at 2023 PL.

Sir,

Jamrani Dam Multipurpose Project has following major components (i) Construction of 150.6 m high Roller Compacted Concrete Gravity dam at Jamrani on Gola River, 10 km upstream of Haldwani city (ii) Irrigation component including extension of canals in Nainital and Udham Singh Nagar districts of Uttarakhand and to increase the irrigation benefits to 1,50,302 ha CCA in Nainital & Udham Singh Nagar districts in Uttarakhand and Rampur and Bareilly districts in Uttar Pradesh (iii) Drinking Water Supply of 42.70 MCM to Haldwani and nearby areas (iv) Construction of a dam toe power house for generation of 14 MW clean hydro power.

2. Jamrani Dam Multipurpose Project has been **approved on 25<sup>th</sup> October 2023 by the Cabinet Committee on Economic Affairs, Government of India at a cost of Rs 1730.20 Cr.** (2018 price level), Which comes out after the deducting Rs. 853.9 cr. for Electro-Mechanical, Establishment cost and already expenditure incurred from approved cost Rs. 2584.1 cr.

3. It is pertinent to mention that DEA's Screening Committee approved the proposal of the State Government of Uttarakhand for posing the project for ADB's financial assistance on 18 December 2019. For technical examination of the approved DPR of the project, ADB appointed a Panel of Experts (PoE) in November, 2021. The key members of the PoE are as given below.

- (i) Mr. Quentin Shaw (UKG) - Dam & Hydraulic Expert / Chair
- (ii) Mr. Silviu Ianos (FRA) - Geologist
- (iii) Mr. Felix Seebacher (AUT) - Hydrologist
- (iv) Mr. Thomas Weber (SWI) - Seismologist

Comm(SP)

4. PoE of ADB submitted its inception report regarding type of dam (RCC Vs CVC) in which it is observed that the proposed orifice spillways are problematic for an RCC dam type for several reasons. **Firstly**, the orifice itself and the structure above, which supports the gate, must be constructed in conventional concrete, which implies the need to provide facilities for vertical construction of the central part of the structure, separating the two flanks, which must accordingly be provided with separate RCC delivery systems. Consequently, from the level of

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the base of the gate, the simple single RCC construction becomes three separate construction operations. **Secondly**, the presence of the orifices and the heavy mass concrete above will significantly concentrate stress under earthquake load in the structure around and immediately above and below the gate, resulting in substantially higher tensile stresses within the dam structure than would be the case for a surface spillway. **Thirdly**, the consistently achievable vertical tensile strength of RCC is realistically limited to approximately 1.7 MPa, compared to approximately 3.5 MPa for equivalent CVC, which gives CVC a significant advantage on high dams, subject to high seismic loading. Furthermore, it is substantially easier (and commonplace) to zone concrete in a CVC dam, allowing the use of different levels of cementitious materials in different parts of the dam structure, which is of particular relevance in a region of high-seismicity, where critical stress demands will be moderate in the core at the base and particularly high on the upstream and downstream faces over the upper 1/3 of the dam height. In zones of high-tensile stress, it would be quite practical to use concrete with a static tensile strength as high as 5 MPa.

5. Many additional studies/ works have been taken up on the insistence of PoE. Some of them are:

- Geophysical Seismic survey
- Probabilistic Seismic Hazard Analysis
- Comparative assessment of cost of RCC and CVC dam
- Dynamic Analysis of dam
- Fault Displacement Study
- Dam Break studies
- Additional testing of rock samples from drift and core boxes

6. It is suggested by PoE that a simple five-step comparison be made to decide the type of material of the dam.

Firstly, the delivered cost of fly ash at the Jamrani site should be verified.

Secondly, a basic 2-D response spectrum dynamic analysis of the maximum NOC section should be performed under a recommended PGA and the optimal sections respectively indicating a maximum dynamic tensile stress of 3.4 MPa should be identified for an RCC solution and 7 MPa for a CVC solution.

Thirdly, the respective dam concrete volumes should be re-calculated with the applicable sections for the non-overspill gravity flanks, as derived above, and the current section for the spillway.

Fourthly, the dam should be divided into four components and the respective concrete volumes calculated.

Fifthly, different unit rates should be applied for each of the zones for the RCC and CVC options, multiplying by the applicable concrete volume and summing to make a comparison between the two dam type options.

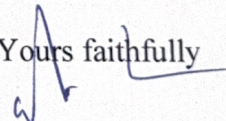
7. A report on the issue was provided by the consultant after reviewing geological, geotechnical investigation reports, dynamic analysis report along with site visit and fly ash survey. The report of consultant and dynamic analysis of dam is being **attached** for your reference.

8. The cost of Jamrani dam and its appurtenant works (Civil and Hydro-Mechanical) have been revised at current price level (2023) is Rs 3751.59 cr and the revised cost estimate is being sent with all annexures along with drawings. Machine rates are also updated on the basis of quotations which have been taken from authentic firms at current price-level and accordingly the revised cost estimate is being **attached** along with old estimate.

SL.No.	Sub Heads of The Project	Rs. In Lakh
1	Preliminary Works	5666.28
2	Land, Rehabilitation & Resettlement Expenses	60506.03
3	<b>Construction of Dam and its appurtenant Works</b>	<b>252305.28</b>
4	Residential and Non Residential Buildings	2800.20
5	Canal Works related to Dam	39858.63
6	Jamrani-Amritpur and Other Service Roads	5053.09
7	Environment and Ecology	5307.25
8	Misc. Expenses	3662.71
	<b>Total I-Works</b>	<b>375159.47</b>
	<b>Total I-Works Rs. 3751.59 cr</b>	

9. Since Jamrani dam Multipurpose project has got recommendations from CCEA under PMKSY-AIBP, as per the above discussions in Para 1 to 6, the change in type of dam and accordingly the cost of dam and appurtenant works could be a better option with regard to construction methodology and saving in cost. It is also pertinent to mention that **CWC will be the review consultant of the project** so before starting of construction activities all the construction designs and drawings will also be vetted by Centre Water Commission.

It is my humble request to consider the revised **cost estimate of Rs 3751.59 cr.** for financial approval of Jamrani dam and its appurtenant works .


Yours faithfully  


(Hari Chandra Semwal)  
Secretary

No.

Copy to the following for information.

1. Chief Secretary, Uttarakhand.
2. E-in-C, Irrigation Department, Uttarakhand.

  
 (Hari Chandra Semwal)  
Secretary