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RUBBER DAM

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ABSTRACT

Rubber dam is a relatively new type of hydraulic structure compared with still sluice gate, weir, and cause way, etc. which is made of high strength fabric adhering with rubber forming a rubber bag. The barrage, made of rubber, will be filled with air, so that it can be inflated or deflated as per requirement. The concept of rubber dam and its application in India was yet to develop to gain from its advantages thought the system has been used in great extent countries like china, Australia, etc. it is used in site specific cases where it may prove to be a very good alternative to costlier permanent structures. A rubber dam has many advantages, such as simple hydraulic structure, short construction time perfect seismic performance and low resistance to water flow in flood season etc. general description of system various configuration and type working principle and comparative analysis has been presented in this paper. Combine with water management of urban areas this could be a very effective tool of river water management, especially for cities near the banks of rivers. The first case study of rubber dam is on the river JanjawatiRubber dam have been used in china over the past 40 years as cheaper water conservation structure comparatively conventional gated structure like barrage especially in small and medium river .

Keyword: Rubberdam, Hydraulicstructure,High Strength,Fabric, Water Management,Flood Control.

I. INTRODUCTION

Rubber dam is different types of hydraulic structure compared to a conventional water retaining structure with gets and weirs to release the surplus water, such as dams and barrages such type of water retaining structure (rubber dam) themselves could also serve the purpose of releasing the surplus water over the body of dam by empting field water or air from the dam, which are mostly used for flood release. Rubber dams have been used in china over the past 40 years as cheaper water conservation structures. Rubber dam have wide prospect in the world since they can be used specially for irrigation, hydropower generation, environmental improvement and recreation purpose. Rubber dams are not known to have other than beneficial impact on environmental & ecology. Rubber dams have certain definite advantages within their applicability range. Rubber is inflatable and deflectable material and some the hydraulic

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structure may be located in cold area where the temperature may be as low as-40°C.the water-filled construction of rubber dams can be constructed for water heads even from 0.3 meters to more than 3meters.

II. HISTORICAL DEVELOPMENT OF RUBBER DAM

Since immortal, it has been operates, endeavor to creates the inexhaustible storage of water for irrigation purpose. And dam is the ultimate solution to it. This need was created to construct the dam. Since then up until now, number of different types of dams is constructed. And one of such dam is rubber dam. a French engineer, Mr. Mesnager in 1947, invented the board worked on the project in the fitness In 1959, the first inflatable rubber dam was installed in the USA as a part of water supply project for the city of los angles. The American engineer responsible for the first and subsequent installation was Mr.imberston. In 1960, the first electricity board ordered its first rubber dam in aubas on the Vezere River. In the following decade, ten inflatable rubber dams were installed in france of which four were for French electricity board. Half of these dams still operating and working efficiently.In addition, after this period up until was about 2000 rubber dams were installed in USA and 1500 rubber dams were installed in japan. However, today unfortunately India does not have any rubber dam. The nearest dam site to India is Bangladesh. In Bangladesh, a city called coxbazar has this type of dam.

III. OPERATING PRINCIPLE

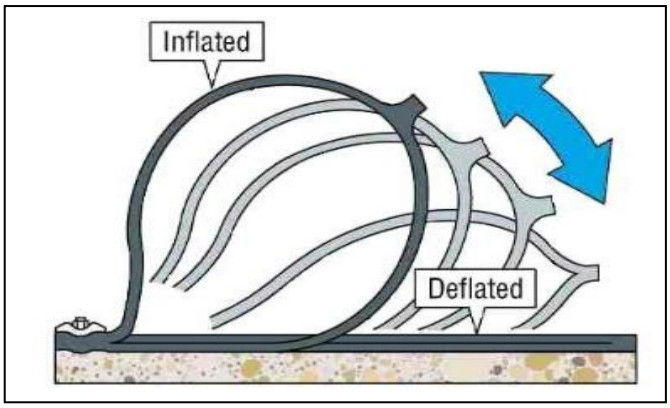

Fig.1.Operating principles

Inflatable dams can be filled with water, air & both .they are low pressure-typically 4 to10 psi. Thepresent trend suggest and increased use of air- filled membranes because they can be deflated or inflated more rapidly, and they are little affected. Water pumped through a pump shaft, which is linked via tube as a “communicates container “with the control shaft. The latter is filled with a water level regulating installation.

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IV. MATERIAL USED FOR RUBBER DAMS

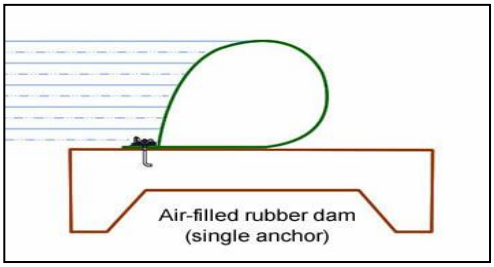
Main material use in rubber dam is "rubber bag "which control the flow of water\\some characteristic of rubber bag are:

1. It is multi –layer fabric of synthetic fiber (usually nylon).the fabric is quite flexible and exhibits good wear – resistance characteristics.
2. The fabric bag should be water resistance ,water tolerant, corrosion resistance and durable in atmosphere.
3. The layers of rubber coated fabric are joined in the longitudinal direction .the actual number of layers of rubber coated fabric for each rubber body depends on the height and the tension.

V. CLASSIFICATION OF RUBBER DAM

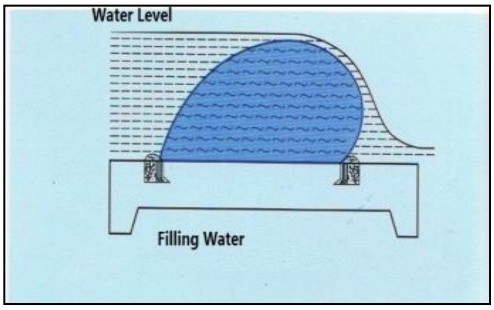
1. Air filled Rubber dams

In these types of rubber dams, the inflation medium used is air. This type of rubber dam is particularly useful in cold countries where freezing of water freezing of water is the main problem with which is mainly infested. The standard inflating air pressure given be any manufacturer is 30 Kpa. At this pressure dam is fully inflated & it gains circular shape.



2. Water filled Rubber dams

In these types of rubber dams, the inflating medium used is water. This has special advantage over the air filled rubber dams that this has easy deflating process. But in case of cold region water may get freezes & to avoid it continuous circulation is required & thus maintenance cost gets increased.



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3. Combined air & water filled rubber dam

This type of dam uses both the medium i.e. air & water for inflating. At the first water is filled in the tube & then air is filled in the tube. This is recent development. This type of rubber dam is easy to deflate & it is assumed that this dam deflated completely.

VI. ADVANTAGES

1. Easy construction process
2. Rubber dam have a simply inflate on and deflation mechanism
3. A light upper structure and uniform load of rubber dam body minimize uneven foundation settlement
4. The flexible structure of rubber dam virtually eliminate the influence of d/s dirt and sediment
5. The rubber dam can be installed on virtually any side slop
6. Rubber dam only requires only light foundation leading to considerable saving in time and cost
7. principal of rubber dam, "companies national du rohane" showed interest in the early development work and French electricity Rubber dam with along spans can be installation might be increased
8. Rubber dam have lower maintenance cost.

VII. DAM MAINTENANCE

The safety of the dam relates to responsible operation, maintenance and inspection of its structural elements so that there is an adequate margin of safety collapse or failure of dam.

The various maintenance jobs can be divided into 2 categories

Routine Maintenance

a) Daily

b) Periodically

Special Maintenance

7.1 Routine Maintenance: Maintenance which is carried out either daily or periodically.

7.1.1 **Daily Maintenance**:

It is carried out by the departmental labor through out of the year .

Daily maintenance of dam involves following job.

a. Daily inspection of dam section.
b. Tightening of loose bolts.

7.1.2 **Periodic maintenance:**

a. Maintenance of reinforced rubber material.

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b. Maintenance of water pipes for water –filled rubber dam.

c. Maintenance of drainage system.

d. Maintenance of air valves.

e. Maintenance of air of water mechanism system.

f. Maintenance of side –fittings of rubber tube.

g. Removal of silt or debris.

7.2 Special Maintenance

This type of maintenance is carried out whenever necessity. In case of any accidents related to the rubber tube maintenance.

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