

## **SUPPLEMENTARY PAPER ON DESIGN GUIDANCE NATURAL WATER SOURCES BEING USED FOR FIRE PROTECTION PURPOSES**

### **1. Background**

Usability of natural water sources for fire protection system has been discussed during the Technical Sub Committee (TSC) meeting where it was decided that if it is operable with specified conditions and as NFPA accepts such options then it may be adopted as a remediation solution. The RSC has developed an independent implementation guidance based on the outcome of the discussion, which may aid industry in completing their remediation plan in a timely manner.

This paper is to address the desired acceptance level for natural water sources being used for fire protection purposes.

### **2. Standard Requirement/s:**

#### **RSC Technical Guidelines (Standard)**

According to the RSC Technical Guidelines (Standard) Section 5.5; All new installations and design requirements outlined in BNBC 2006 and BNBC 2020 for water supplies shall be replaced by the requirements of NFPA 20 (fire pumps), NFPA 22 (water tanks), and NFPA 24 (underground water mains). Existing water supplies shall be evaluated for reliability and support the hydraulic demands and duration of any new or existing systems supplied.

#### **NFPA Standard**

NFPA 13 Ch 24 Water Supply (Gravity Tanks and pressure tanks specified) requires an assessment of water for contamination and states in 24.2.1(6)- A penstock, flume, river, lake, pond, or reservoir in accordance with 24.2.6, which states: Penstocks, Flumes, Rivers, or Lakes. Water supply connections from penstocks, flumes, rivers, lakes, or reservoirs shall be arranged to avoid mud and sediment and shall be provided with approved double removable screens or approved strainers installed in an approved manner.

NFPA 20: Ch 4, 4.6 Liquid Supplies: 4.6.2-Sources- 4.6.2.1 Any source of water that is adequate in quality, quantity, and pressure shall be permitted to provide the supply for a fire pump.

4.6.2.3 The adequacy of the water supply shall be determined and evaluated prior to the specification and installation of the fire pump.

4.6.4 Stored Supply.

4.6.4.1 A stored supply plus reliable automatic refill shall be sufficient to meet the demand placed upon it for the design duration.

4.6.4.2 A reliable method of replenishing the supply shall be provided.



#### 4.14.8 Suction Screening.

4.14.8.1 Where the water supply is obtained from an open source such as a pond or wet pit, the passage of materials that might clog the pump shall be obstructed.

#### **Challenges:**

##### **Surface water supplies should be of**

- Dedicated source.
- Adequate quality and quantity.
- Suction supply piping properly designed, arranged, installed, and maintained.
- Location of ponds relative to building and how to achieve positive suction.

##### **Surface Water Quality Concerns are**

- Reliability and source of replenishment.
- Elevation and location with respect to fire pump.
- Legal right to access and use water source.
- Dedicated use for firefighting.
- Contamination and water treatment.

### **3. Implementation Guidance:**

1. It should be left to the factories to decide whether it is feasible to use the natural water source for the purpose of fire protection system considering long term sustainability & serviceability of the system.
2. It is important to distinguish between dedicated ponds for fire protection and natural water bodies. Ponds that are to be used for the purpose of fire protection should be designed for that purpose with a water treatment facility.
3. A supplemental means to replenish the natural water source (by WASA, sub-surface water by deep tube well or other reliable means of replenishment source) is required if it is being used for firefighting purposes unless the source has a capacity which is many times the fire demand.
4. Where the water supply is obtained from an open source such as a pond or wet pit, a suction screening should be provided according to NFPA 20 Section 4.14.8.
5. A thorough investigation on proposed open water source (for example lakes, streams, ground water supplies) shall be performed to ensure that the water for fire protection system is suitable and reliable. Investigation must include parameters i.e., the seasonal fluctuation and minimum amount of water retained after seasonal influence, quality of water to ensure whether the water is potable, existence of vegetation and aquatic life, surrounding catchment area and earth protection etc., amount of silts and gravels. An investigation report shall be produced accordingly and require to be submitted to the RSC for review.



#### 4. Recommendation:

Section 2 & 3 within this supplementary paper provides detailed specifications/ guidance on usability of natural water sources for the purpose of fire protection which will assist the user with adequate guidance and knowledge on fulfilling the remediation requirement accordingly.

#### 5. References:

RSC Technical Guidelines (Standard)  
Accord Building Standard V1.1  
BNBC 2006  
BNBC 2020  
NFPA 13 Standard for the Installation of Sprinkler Systems  
NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection  
NFPA 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances

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