PREPARATION OF CONCRETE IN THE WINTER SEASON AND THE PROCESS OF PREPARATION AND HARDENING OF CONCRETE IN THE WINTER SEASON

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Annotatsiya. Ushbu maqolada qishda beton tayyorlashning asosiy maqsadi - suvning muzlashining oldini olish muhokama qilinadi. Bunga erishish uchun: Unda issiq suvdan foydalanish, antifriz qo‘shish va betonni issiq sharoitda saqlash zarurati muhokama qilinadi.

Kalit so‘zlar: qurilish ishchilari, beton, qolipga va ustunga quyish, quyilgan beton, issiq va suyuq, yangi quyilgan, shamol, plyonka, issiqlik izolyatsiyasi.

Аннотация. В статье рассматривается главная цель приготовления бетона зимой — предотвращение замерзания воды. Для достижения этой цели обсуждается необходимость использования горячей воды, добавления антифриза и хранения бетона в теплых условиях.

Ключевые слова: строители, бетон, заливка в опалубку и в колонну, заливной бетон, горячий и жидкий, свежезалитый, ветер, пленка, теплоизоляция.

Abstract. The article discusses the main goal of preparing concrete in winter - to prevent water from freezing. To achieve this: It discusses the need to use hot water, add antifreeze, and store concrete in warm conditions.

Keywords: construction workers, concrete, pouring into the form and into the column, Poured concrete, hot and liquid, freshly poured, wind, film, thermal insulation.

INTRODUCTION

People are walking around the construction site in warm clothes, and the air is icy and snowy. On one side, sacks of cement, sand, and gravel are stored dry in a warehouse. During the concrete preparation process, small containers of hot water are placed nearby, in special heaters to keep the water hot. The air temperature is approximately -5°C. All materials for concrete are protected from frost.

Stages of the concrete mixing process.

1. During the mixing process of concrete, water, cement, sand, gravel, and heat are mixed in a concrete mixer. With the help of a worker, a small container of

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antifreeze (liquid or salt) is added. As the mixer rotates, steam is released from the mixture inside the mixer, which means that heat is retained inside the mixer. Antifreeze prevents additional water from freezing.



Figure -1. The process of preparing concrete and pouring concrete in a concrete mixer.

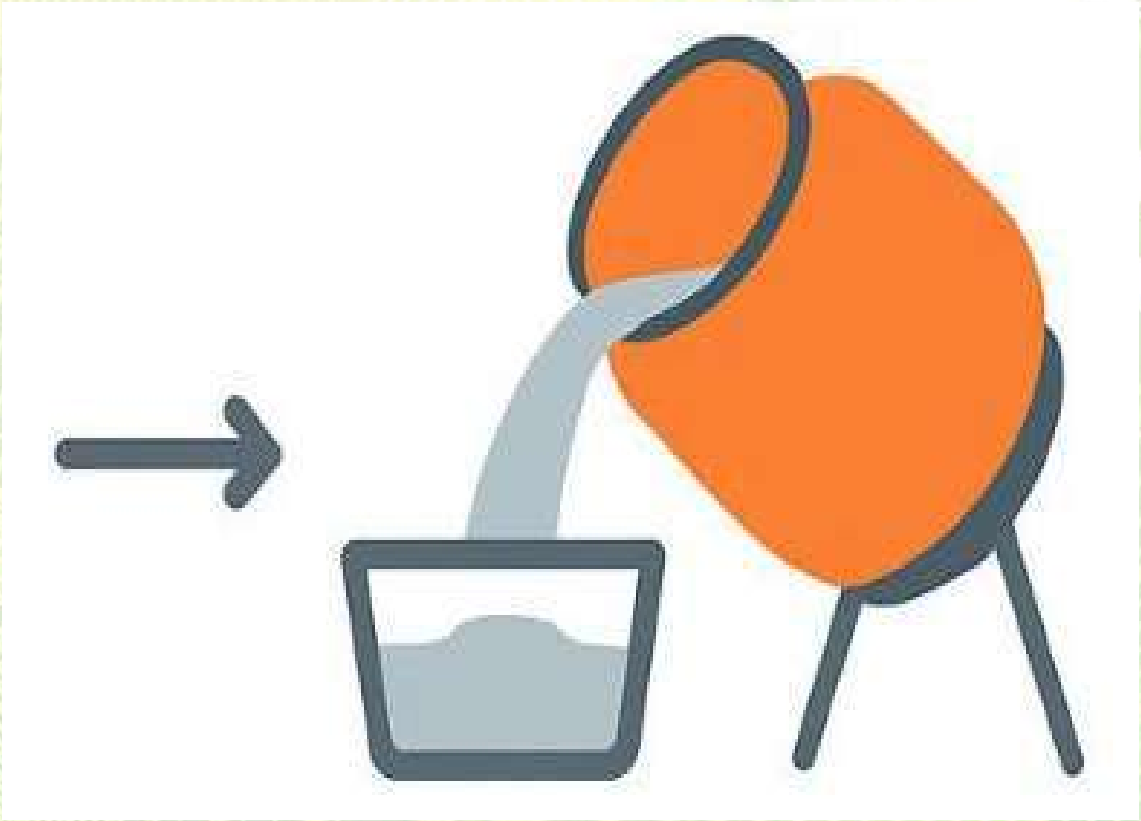


Figure -2. Stage of pouring antifreeze into concrete.

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2. With the help of construction workers, concrete is poured into the formwork or into the column. The poured concrete is still hot and liquid. The newly poured part is covered with a film to prevent wind from entering. Another worker covers the concrete mixture with a film fabric or thermal insulation material. This retains heat and prevents the concrete from freezing.

3. The hardening process (hydration) is the process of hardening concrete in a closed form. A little steam is visible under the film on top, which indicates that the reaction is taking place inside the concrete. A small thermometer in one corner shows: +5°C. Due to the effect of antifreeze, the temperature inside the concrete is maintained, and the cement hardening reaction does not stop.

4. Ready concrete result. After 7-10 days, it continues to snow, but the concrete pillars are standing strong. The masters are removing the film, the concrete surface is compacted, without cracks. So, the process of preparing and hardening concrete in winter is carried out in 5 stages.



Figure 3. Added mixture decomposition process

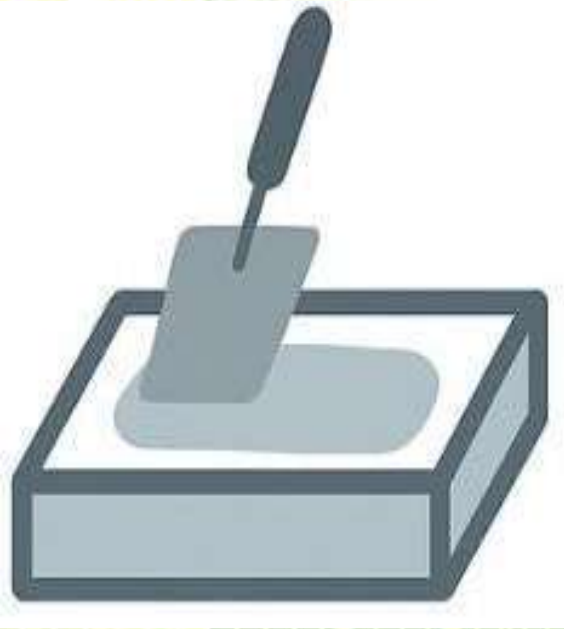


Figure 4. Compaction process

In the preparation of raw materials, sand and gravel are prepared for cement. At the beginning of concrete preparation, the prepared materials are added step by step, and hot water is poured in at a temperature of 40–60°C. In the mixing area, the concrete mixture is prepared in this way.

Sand and gravel are cleaned of snow. Raw materials are stored in a warm place. Sand and gravel are cleaned of snow and lightly heated. Hot water ensures that the concrete is mixed without freezing. In the 2nd stage, when adding antifreeze additives, antifreeze substances ($CaCl_2$, $NaNO_2$) are added to the

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concrete mixture. Anti-cold reaction activity is observed. Antifreeze is added to the concrete mix to preserve the cement reaction and stop the freezing process.

In the 3rd stage, the mixer rotation should be uniform during the preparation of the mixture. The temperature in the mixture should be +10°C. The concrete mixture is prepared in a high-speed mixer. The temperature should be maintained around +10°C.The 4th stage is the process of pouring water and preserving heat. Description of the scheme: Covering the concrete mold: Covering it with a film or tarpaulin retains heat in the mixture. The poured concrete is covered with a film or covered with warm materials. This retains heat and prevents freezing.In stage 5.

The process of concrete hardening is monitored and controlled. Temperature control is monitored in the concrete structure. The temperature observed on the thermometer is recorded in a log. The temperature is checked daily during the hardening process.If the temperature is below 0°C, the heat is turned on again.

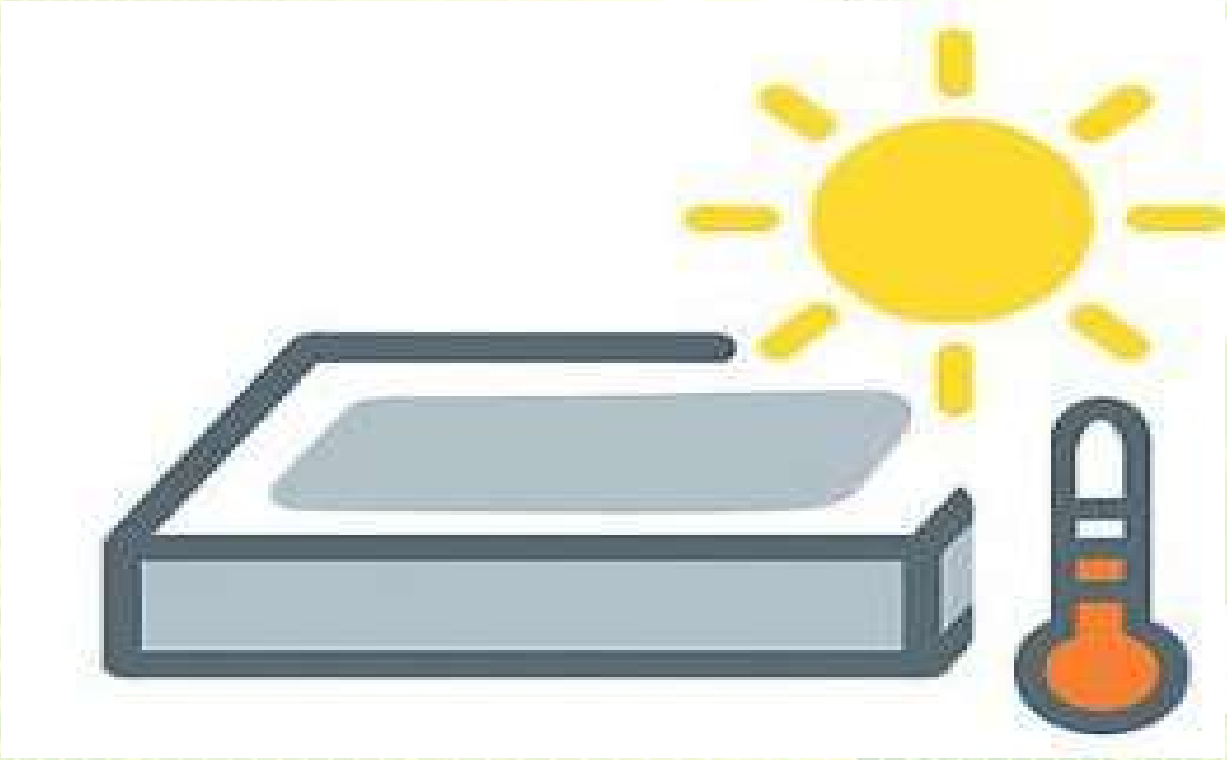


Figure 5. Concrete hardening process.

CONCLUSION: The main task when preparing concrete in winter is to maintain a positive temperature, prevent water from freezing, and not stop the hardening process.For this, hot water, antifreeze agents, and heat-retaining coatings are important. Antifreeze agents ensure that the concrete hardens without freezing.

The amount of additive is determined by the temperature. During mixing, the temperature should be maintained around +10°C. If the speed is high, the liquid will have a uniform composition.Stage5.Curing and control. Cured concrete. Temperature control. Thermometer, recorded daily. Note: The concrete

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temperature is checked daily. If it is below 0°C, an additional heat source is provided.

CONCLUSION

The main goal of preparing concrete in winter is to prevent water from freezing. To do this: It is necessary to use hot water, add antifreeze agents, keep concrete in warm conditions.

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