

Heating.—Most contractors will provide heated sand for all masonry work at temperatures below 32 F, whether specified or not. This is done because mortar of the proper workability is thereby provided, promoting maximum production by masons.

Sand for use in mortar usually contains some moisture which will turn to ice if sand is stored in freezing temperatures. Before it can be used, sand must be thawed by heating to remove ice. Sand must be heated slowly and evenly to prevent scorching. Scorched sand (with a reddish cast) must not be used in mortar. Proper heating may be accomplished by piling the sand around a horizontal metal culvert or smoke stack section in which a slow fire is built. Oil drums, or the like, may also be used, provided they are thoroughly cleaned beforehand. An alternate method is to pile sand over steam pipes.

An easy method of increasing the temperature of the mortar is to heat the mixing water. Several methods are available for heating water. Any method which does not add deleterious matter to the water is acceptable. Rapid heating may be accomplished by the injection of steam, where available. Mixing water should not be above 160 F, because of the danger of a flash set when portland cement is introduced.

After combining all ingredients, the temperature of the mortar should be between 70 F and 120 F. If mortar temperatures are over 120 F, excessively fast hardening may occur, resulting in lowered compressive strength and reduced bond strength.

Mixing.—Batch concrete mixers are recommended on all large jobs; they are sometimes economical on smaller jobs. Some modern mixers are equipped with a skip hoist, water tank and water-measuring device, which control the mix and produce well-mixed mortar of the proper workability.

Steel mortar boxes may be used for hand mixing on smaller jobs. These should be raised above the ground on piers of masonry units laid dry. Fires of waste building wood or steam may be used to keep the mortar warm after mixing. Mortar should be delivered to masons at such rates that excessive cooling will not occur.

PREPARATION OF MASONRY UNITS

To prevent sudden cooling of warm mortar in contact with cold units, it is recommended that all masonry units be heated when the temperature is below 20 F. Masonry units should be heated to about 40 F. It is seldom necessary to raise their temperature much above this amount. Even when temperatures are above 20 F, it may be advantageous to heat units. With heated units greater mason productivity may be obtained.

During cold weather construction, brick having excessively high rates of absorption should be sprinkled with warm or hot water just before laying; those with low rates of absorption should be laid dry. Under typical summer conditions, walls built with units having suctions of 20 g or less at time of laying exhibit greater resistance to rain penetration than like walls built with units of higher suctions. During winter months the loss, to the atmosphere, of moisture from mortar and newly laid masonry is less rapid, so units might be laid with slightly higher suctions. Where maximum resistance to rain penetration is not required (interior walls or in areas of moderate rainfall and wind) or where the wall design is barrier type (grouted) or drainage type (cavity or furred and flashed), it may be permissible in the winter to lay units with suctions up to 40 g and still obtain walls with high strengths.

PROTECTION OF MASONS AND MASONRY

Protection requirements will vary with weather conditions. With warm mortar and mean daily temperatures above 25 F, tarpaulins covering the masonry may be sufficient. When mean daily temperatures are between 20 F and 25 F, covers of insulating blankets may suffice for the completed wall. Masons may work in the open with salamanders as a source of heat at temperatures down to 20 F. When wind velocities are above 15 mph, and temperatures are below 25 F, windbreaks should be provided to protect the masons. Also, the windbreaks will assist in preventing rapid loss of surface heat from the masonry being worked upon.

It is recommended that the air temperature be above 20 F when masons are working in the open. In addition, consideration should be given to the protection of the masonry based upon the mean daily outside temperature.

The mean daily outside temperature is determined by adding together the maximum temperature for each day (24 hr, midnight to midnight) and the minimum temperature for the same day and dividing by 2.