

Cement Concrete Sidewalks.

Much has been said in these columns with regard to the construction of cement concrete sidewalks, and much, no doubt, remains to be said. The material is every year growing in favor and is certainly worthy of its popularity. It is an artificial stone which has replaced natural stone and plank for this class of work. It cannot be repeated too often, however, that cheapness is the only quality which these walks must possess. A cheap walk, unless built of good materials, and with care and skill, is apt to be dear at any price.

The first thing in laying these walks, is to decide what must be done to the natural soil on which the concrete is to be laid in order to secure a good foundation. In many cases underdrainage is necessary. That is, a tile underdrain should be laid under the centre of the proposed walk and carried with a uniform and sufficient grade to a free outlet. Whether or not the drainage is necessary will depend on the amount of natural drainage afforded. If the soil is sand or gravel, it is porous, and does not hold water to at all the same extent as loam and clay. If the location is low lying, or receives the soakage from higher levels, no matter what the soil, it will need attention to drainage. This can only be properly decided by a careful study of the location. These underdrains are usually laid at a depth of two, or two and a half feet below the surface of the finished walk, but the nearer they are laid to the frost line the more effectual they will prove. A depth of three or even four feet will be found most satisfactory, but rather than omit the tile altogether, when needed, it is better to adopt the customary depth.

If the soil is sand or gravel and is well drained, nothing further is needed except to excavate and grade it to receive the cement, tamping and ramming it to a compact bottom. If the soil is clay, loam, or vegetable mould, it is better to excavate an additional foot, and refill with gravel, stones or brick-bats. If stones and brick-bats are used, this layer should be covered with a coating of gravel or cinders (not ashes), which should be well rammed, and upon this, the first layer of concrete may be placed.

In ramming, it is not necessary to break the handles, but a clean, smart pounding is better than trying to make a hole every time the rammer goes down. Observe that the edges against the guides or curbs receive especially good ramming. This is apt to be neglected by the workmen, as it is likely to push the guides out of place.

In placing the concrete, a four-inch layer is first put down, and this is covered with an inch coating. The concrete, as with the sub-soil, should be rammed as described, so as to compact the material, fill all cavities, and force out air bubbles. No more of the first layer should be put down than can be at once given the top coating. The first layer of concrete should

not be exposed longer than it takes the topping gang to cover it.

The first four-inch concrete layer is composed of cement, sand and broken stone, or cement and gravel. The inch top-layer is composed of sand and cement; or to this may be added very finely-crushed granite. Granite is recommended largely because of its tendency to crush into cubes, many other varieties of stone, flaking. A cubical stone at the surface wears down with the rest of the walk, but a flake is liable to chip out, leaving a cavity.

Concrete should never be laid in freezing weather, nor if there is any chance of a frost. It is best laid in damp or cloudy weather. If the sun or wind is strong it is advisable to keep the surface thoroughly wet, in order to allow the concrete to set as slowly as possible.

The concrete should be mixed only as needed. If too much is prepared at once it will commence to set before being laid in place. It does not take the concrete long to begin to set after being mixed. The box should be right beside the work if possible. Any concrete which has taken a set before being put in place should be discarded. It cannot be re-worked, and if used in the walk, may be given a seemingly good surface appearance for a time. It will quickly deteriorate, however, the interior will be found separated and dried, full of air spaces, and without bond.

The Abolition of Statute Labor.

The last municipalities to report the commutation of statute labor are Pelham, Pickering and Assinack. In Pickering the rate is placed at sixty cents per day. For the expenditure of the commutation monies the township has been divided into eight road divisions, each under the charge of a commissioner. The money collected in each division is to be expended therein, a sufficient amount to be reserved for keeping the roads open during the winter season. The by-law also provides that the commutation money shall be collected in the three principal villages, and expended therein for sidewalks, etc. In hiring teams and men, the commissioners are to give preference to ratepayers having the proper equipments for the work to be done. In Pelham the rate has been placed at fifty cents per day, and two commissioners are appointed for the township, to have charge of all work done, subject to such written instructions as they may receive from the road and bridge committee of their division.

The township of Assinack in the Island of Manitoulin, a municipality in one of the more remote and pioneer sections of the province, has taught many of the older townships a lesson. That the citizens have been sufficiently progressive and enterprising to discard the statute labor system for one that will guarantee the best returns for such energy as can be devoted to the improvement of

their roads, is certainly a praiseworthy distinction for so young a township. Why older townships with years of waste to instruct them, should be so firmly wedded to the system of patchwork, is becoming more and more of a mystery. There are now thirty-three townships which have abolished or commuted statute labor. Another year should see the list greatly extended.

The Ventilation of Sewers.

An examination of the sources of air pollution by sewer gas, shows that the most favorable conditions for its productions are in the soil, pipes and house connections, so that trapping off these from the main sewer will not prevent the poisoned air from entering the building. The aim should therefore be not only to exclude from buildings the sewer air but also the air from their own piping. Attempts have been made to use forced ventilation, but with the exception of the Liernur system, in which the outlets are tightly sealed, these have not been successful.

With fewer pipes and house connections as now constructed, the only practical plan seems to be that of providing the greatest freedom of air circulation in both sewer and connected pipes. Open channels for these would afford the freest ventilation, but this construction is objectionable for several reasons, and the nearest approach possible seems to be to provide the maximum number of connections between the sewer and the outer air. One means to this end is the construction of numerous manholes with perforated covers. If the street water enters the sewer, the inlets can also be used for this purpose, if no traps be placed in the pipes connecting them with the sewer.

Sewers carrying house sewage can be ventilated through the house soil-pipes if the running or main traps be omitted, or through pipes leading from below the main traps and extending above the roofs of the buildings. If a sufficient number of these and other outlets are provided, continuous circulation of air is caused by difference of temperature between the sewer air and that outside, by wind blowing, or into the openings by fluctuations in the volume of the sewage which increases or decreases the total air space in the sewers, by the friction of the flowing sewage upon the air, and by other minor causes. Special inlet or outlet pipes placed along the curb or elsewhere are seldom other than beneficial, but cannot be relied on to act always as either inlet or outlet alone, and are probably not more beneficial than untrapped soil pipes of the same size; and if it can be shown that untrapped house and inlet connections, combined with ventilating manholes, furnish ample ventilation for sewers, and that such use of them is not objectionable, the construction of special ventilation devices would seem to be a needless expense and complication.